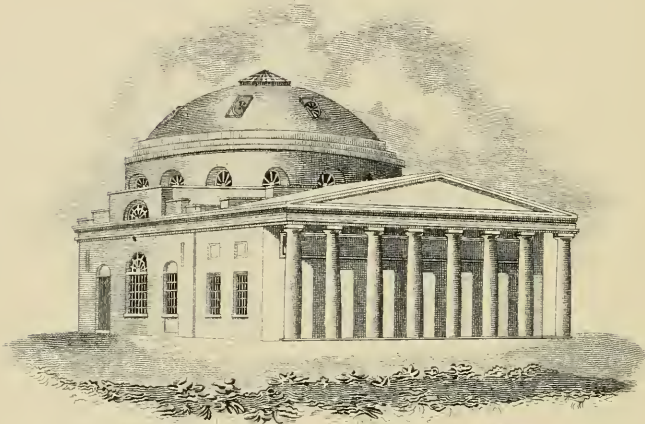


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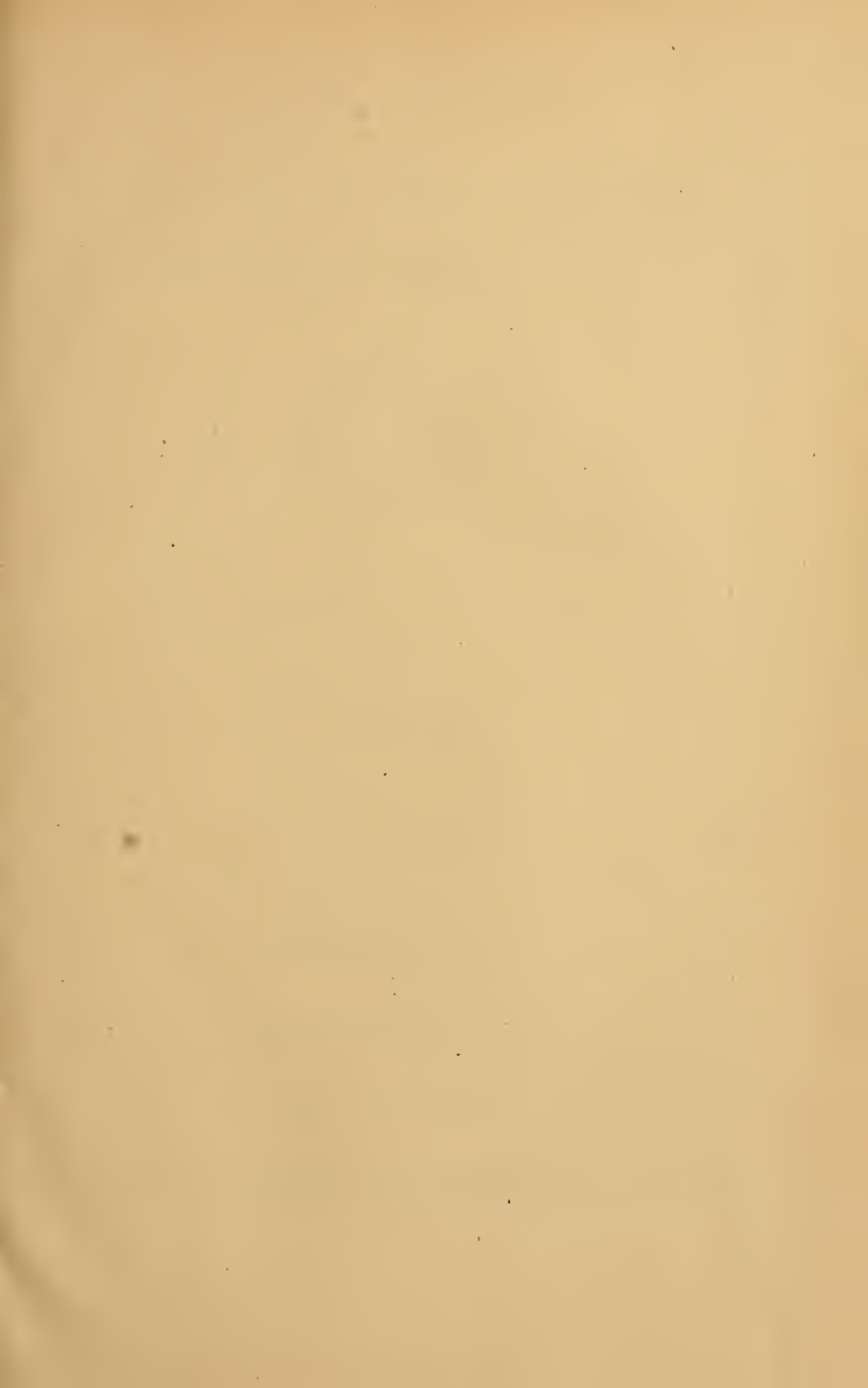
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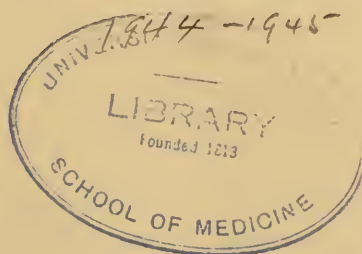


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BULLETIN  
OF THE  
SCHOOL *of* MEDICINE  
UNIVERSITY OF MARYLAND



VOLUME 29 ~~No. 1~~



*Publishers:*  
FACULTY OF PHYSIC  
UNIVERSITY OF MARYLAND  
BALTIMORE

PUBLISHED FIVE TIMES A YEAR  
(JANUARY, APRIL, JULY, SEPTEMBER AND OCTOBER)

Lombard and Greene Streets  
Baltimore 1, Md.

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Entered as second-class matter June 16, 1916, at the Postoffice at Baltimore, Maryland  
under the Act of August 24, 1912.





# BULLETIN

OF THE

## SCHOOL OF MEDICINE

UNIVERSITY OF MARYLAND

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Vol. 29

JULY, 1944

No. 1

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### HYPERTHYROIDISM IN PREGNANCY\* †

LIEUT. GEORGE H. DAVIS, M. C., A.U.S.

True hyperthyroidism is not frequently seen in association with pregnancy since, as a rule, patients so afflicted are sterile. Those who have followed the greatest number of cases (10) and (9) have observed that pregnancy affected hyperthyroidism little, either adversely or beneficially, but that hyperthyroidism constituted a fetal hazard which was greater the more severe the disease. Abortion occurs frequently in the severely toxic patients, but in those with milder symptoms who are adequately treated there is not much more of a risk than in normal pregnancy.

Although Graves' disease is common in women of the child-bearing age, a report from the Boston Lying-in Hospital includes but twenty-eight cases in 50,000 deliveries. Of 15,000 patients followed by Croom of England (4), eleven had Graves' disease. The New York Lying-in Hospital reported only eight cases in 100,000 pregnancies. From May, 1916 to May, 1926, of 5043 women seen there with Graves' disease only thirty-two were pregnant. At the Obstetrics Clinic of the School of Medicine, University of Maryland eight definitely proved cases of hyperthyroidism in pregnancy were observed in 20,000 deliveries over a ten year period from 1934 to 1943 inclusive. At the Mayo Clinic from 1916 to 1926, ten toxic adenomata concurrent with pregnancy were seen. Of 520 patients early in pregnancy who were examined by the author 41 per cent had some enlargement of the thyroid. Eight of these patients returned in fourteen months after the first examination with symptoms of hyperthyroidism. This series was followed in a section known as a "goiter belt."

To quote DeLee (6): "A slight enlargement of the thyroid is so common that one might even consider it one of the signs of pregnancy. In some of

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† Read at the monthly staff meeting of the University Hospital on March 15, 1944.

the old countries on the Mediterranean, the careful mother gives the daughter a close-fitting necklace and, by watching this, often has advance information of the latter's doings."

Enlargement of the thyroid has been found in from 40 to 90 per cent of all pregnancies in different series, and usually appears late in pregnancy, in multiparas at the fourth or fifth month and in primigravidas at about the sixth month. The enlargement persists throughout the remainder of the pregnancy and generally disappears about two to three weeks postpartum. It may first appear during lactation and probably represents a compensatory work enlargement caused by the increased demand for the thyroid hormone.

Thirty of the thirty-two patients at the Mayo Clinic became pregnant during the disease and two developed toxic symptoms for the first time during pregnancy. In the series reported here thyrotoxicosis antedated the pregnancy in five instances and three patients developed the disease during pregnancy.

The basal metabolic rate increases during pregnancy as a result of greater production of the thyroid hormone. Such determinations are, however, often misleading since the presence of the fetus must be taken into consideration in their evaluation. It has been shown that the apparent basal metabolic rate of the pregnant animal nearly equals the combined rates of mother and young after delivery (11). Some investigators have found that the basal metabolic rate in normal pregnant women showed an increase of approximately 15 per cent, with a fall to normal within the first few days postpartum, therefore as pregnancy progresses five to ten points or more should be deducted from the basal metabolism readings to reach a true determination. A rate of +25 to +30 per cent in late pregnancy is not abnormal unless it does not fall abruptly to normal during the early puerperium.

Even in normal pregnancy the heart rate, circulation time, cardiac output, and oxygen consumption are increased, as is the pulse pressure ratio. All these increases also are present in thyrotoxicosis (8). These writers disagreed with Clute and Davis when the latter said that +25 to +35 per cent is the usual elevation of the basal metabolic rate in normal pregnancy. Hamilton and Thompson also considered a 15 to 25 per cent increased total oxygen consumption as normal, beginning as early as the twelfth week of pregnancy, reaching its maximum at term, and returning to normal promptly postpartum.

In one series of sixteen cases of normal pregnancy the basal metabolic determinations at various times during pregnancy averaged +1 to +2 per cent, the highest being +24 and the lowest -7 per cent. It has been suggested that the basal metabolic rate probably has limited value during pregnancy (8).

Engelhorn (7) in pre-Nazi Germany studied the histology of the thyroid gland in pregnancy. There may be hypertrophy and hyperplasia of the



epithelial cells which become cuboidal or low cylindrical in shape and rich in colloid. The colloid is, however, of a thin, watery consistency. Complex new vesicles are found scattered among the old ones. The iodine content of the gland has been found by different investigators to be decreased, increased, and unchanged. Numerous series of cases in which basal metabolic rates have been studied presented varied and confusing results. Baer (1) observed forty-four women in late pregnancy with the following results:

Thirty-fourth week.....	26 per cent above average normal
At term.....	33 per cent above average normal
Three days postpartum.....	15 per cent above average normal
Eight days postpartum.....	2 per cent above average normal

He predicted the death of the fetus in one patient by a sudden drop in the basal metabolic rate.

It is frequently said that many cases of Graves' disease are relieved permanently by the completion of a successful pregnancy.

Bram (3) advised that a woman with thyrotoxicosis should not be exposed to pregnancy until recovered for at least six months. In 30 per cent of the cases which he observed pregnancy did not aggravate the disease; in 70 per cent it was made worse in varying degrees. In about 15 per cent a crisis resulted with miscarriage or in conditions which required therapeutic abortion, although he reported that it was extremely dangerous to follow this procedure.

The temporary control of hyperthyroidism usually can be attained by iodine given in the form of Lugol's solution and in doses of about 10 drops three times a day throughout pregnancy. Therapeutic abortion does not improve the disease and may precipitate a thyroid disturbance. During pregnancy repeated basal metabolic determinations should be made. If there is no response to iodine therapy, rest in bed, and sedation in two weeks, a subtotal thyroidectomy should be done.

Hyperthyroidism complicated by pregnancy more commonly requires surgical care than does pregnancy complicated by hyperthyroidism.

There is general agreement on the fact that Graves' disease does not usually interfere with the outcome of pregnancy if properly treated. These patients bear normal babies with or without thyroidectomy. Pregnancy after thyroidectomy does not cause a recurrence of the disease nor does it initiate the disease in normal women.

In treatment one should consider the patient's personality, habits, and financial status, and make the surroundings as pleasant as possible. A high caloric diet, rich in vitamins should be given, also sufficient sedation with luminal or other barbiturates in small doses, and hospitalization during the latter months of pregnancy (6).

During the first half of pregnancy thyroidectomy entails little risk to the

mother or fetus, but late in pregnancy it is advisable to postpone surgery until the puerperal period.

Even if iodine has not been used before, the patient with hyperthyroidism should be given 10 drops of Lugol's solution three times daily for the ten days preceding delivery, and 50 to 100 minims, well diluted, during the first twenty-four hours postpartum. The response to therapy is seen in the slowing of the pulse, lowering of the basal metabolic rate, increase in weight, fall in temperature, and improved subjective sensations. In three to four weeks after treatment is begun the pulse is usually normal; then the iodine should be reduced by one mg. a day until an optimal dose is found. These pregnancies should not be allowed to go to postmaturity. Parturition presents two problems: 1) to avoid straining in order to prevent overburdening of the heart or an increase in the vascularity and size of the gland; 2) to see that the patient is given enough analgesia to avoid the shock of the pains of labor. DeLee believed in thyroid surgery only if absolutely necessary and followed a conservative course of rest, iodine, and psychotherapy to allay the fear of pain, delivery, and similar symptoms.

In patients suffering from hyperthyroidism where medical treatment has been ineffectual and surgery is contraindicated, roentgen ray treatment may help; however, the results are variable, and resultant scarring and fibrosis render later surgical procedures difficult.

Labor is likely to be premature in these patients, therefore the fetal mortality is high. Several cases of premature separation of the placenta have been reported. Some writers believe that such patients tend to have severe postpartum hemorrhages as a result of prolonged coagulation time of the blood.

In the Mayo Clinic series none of the patients died while under observation. Twenty-three were delivered normally at term, one was reported to have died elsewhere at the time of delivery, two aborted, two delivered prematurely, two were still pregnant at the time of the report, and three had been impossible to follow.

At the Boston Lying-in Hospital only three patients showed dangerous heart symptoms. Hamilton and Thompson reported that the drive of Graves' disease is seldom sufficient to cause the young heart to fibrillate and fail. The average age of their patients was twenty-nine years. The average of all patients seen with heart failure caused by thyrotoxicosis was fifty-one years. Their patients are usually treated surgically before they are in a dangerous state, but only after medical preparation. In cases where the toxic goiter was found in association with rheumatic heart disease, earlier failure occurred. These patients compensated and decompensated alternately, with remissions and exacerbations of their thyroid toxicity. Four of the Boston group had subtotal thyroidectomies done before the sixth month of pregnancy. None had auricular fibrillation or heart failure, all

survived, and all were delivered of full term living children. Five became pregnant after subtotal thyroidectomy but showed persistent or recurrent toxic symptoms during pregnancy; these were given iodine and all had full term living children. Death in these patients is caused by cardiac lesions or by asphyxia from tracheal collapse as a result of pressure of the enlarged thyroid.

Yoakam (13) found in the Michigan endemic goiter region that with 64 per cent of the prospective mothers receiving sodium iodide prophylactically during pregnancy, 35 per cent of the newborn infants had congenital goiter; when no iodine was given, the incidence increased to 60 per cent.

The iodine must be given throughout pregnancy in such regions and at Byron, Illinois an iodized milk containing iodine in colloidal form has been produced. The cows are fed a diet rich in seaweed, with dried and powdered fish bones obtained from fish canning factories, thus raising the iodine content of the milk to that of seafood.

A follow-up study of women from nineteen to thirty-five years of age having thyroidectomies at the Presbyterian Hospital was made by Bothe (2) to determine the effect upon fertility and subsequent pregnancies. Forty-eight patients were followed. Eleven of these were eliminated as unmarried. Of the remaining thirty-seven, twenty-six or 70 per cent had one abortion or more before operation. Only twenty of the patients were traceable and of these ten had successful pregnancies and one had two successful pregnancies. One had an abortion. Two patients operated on during pregnancy had one successful pregnancy since operation. A high percentage of Bothe's cases gave a history of prolonged nausea and vomiting during previous pregnancies and all noted a decrease of nausea and vomiting in pregnancies subsequent to thyroidectomy.

Schauffler (12) advised that in borderline dystocias a cesarean section may be advisable, rather than to subject the thyrotoxic patient to prolonged labor.

Besides the eight cases proved in the University of Maryland clinic, six probable cases are excluded from this report because of insufficient basal metabolic data to complete the records. Three of the cases were white, the remaining five were colored. The average age of the patients was thirty-four years, the youngest being twenty-eight and the oldest forty years. Three were primigravidas and six multigravidas, with an average parity of six. The basal metabolic rates before treatment averaged  $+43$  per cent. One patient was seen at fourteen weeks of her first pregnancy for diagnostic work; she was not delivered at this hospital and has been impossible to follow. Of the remaining seven patients, five delivered one full term living child, one delivered two full term living children on successive admissions, and one delivered a thirty-four week living child which thrived.

Two had definite cardiac decompensation in late pregnancy and at the



time of delivery. There were no maternal deaths. As mentioned earlier, thyrotoxicosis antedated the pregnancy in five cases, and three developed the disease during pregnancy.

One case was a mild recurrence of Graves' disease during the last trimester of the patient's fourth pregnancy, occurring three and a half years after subtotal thyroidectomy.

The average hospital stay of the patients was twenty-seven days.

Treatment followed the conservative method.

At the time of writing there is in the hospital a patient with thyrotoxicosis who had been started on thiouracil shortly before the termination of her third pregnancy by cesarean section at thirty-two weeks because of complete abruptio placentae. The writer has been unable to find reports of other cases of thyrotoxicosis in pregnancy treated with thiouracil, but it seems likely that as gratifying results will be obtained with the drug in pregnancy as in the disease occurring in the nonpregnant state.

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# DISSECTING ANEURYSM

## WITH CASE REPORTS

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A dissecting aneurysm is a false aneurysm or hematoma within the wall of an artery. It is caused by the penetration of blood into the wall with subsequent separation of the layers of the vessel coat.

Vesalius is credited with making the first diagnosis of an aneurysm in 1557. Morgagni (64) in 1708 first described a dissecting aneurysm. Nicholls (72) in 1728 demonstrated that rupture of the intima may occur without rupture of the adventitia. In 1761 he reported a dissecting aneurysm found at the autopsy on King George II of England. The patient had died immediately after straining at stool. An autopsy revealed a dissecting aneurysm of the arch of the aorta which compressed and almost completely occluded the pulmonary artery. The back pressure from the obstructed artery caused a rupture of the right ventricle. Morgagni reported further on the subject in 1769, as did Lynn in 1798. Maunoir (62) gave a clear description of the condition in 1802, but the name "Anevrysme dissequant" was first used by Laënnec (51) in 1819. Shekelton (98) first reported "healed" dissecting aneurysms in 1822. Pennock (83) in 1838 reported the first case in America. In 1843 Peacock (78) reported nineteen cases and fully discussed the condition. The first correct antemortem diagnosis was made by Swaine (103) in 1856.

## INCIDENCE

A thorough review of the recent literature on dissecting aneurysm reveals 573 reported cases. In fifty-six of these the diagnosis was made before death. This report includes six additional cases, in three of which an antemortem diagnosis was made. These cases are in addition to those previously reported from this school by Farinacci (21).

In the present paper only the cases of "spontaneous dissecting aneurysm" are considered. Those resulting from violent trauma, exogenous erosion such as tuberculosis or abscess, foreign body pressure, acute mycosis of the vessel wall, or neoplasm are not included.

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Read at the monthly staff meeting of the University Hospital on February 17, 1944.

† Received for publication June 2, 1944.

‡ Aided by a grant from the Sydney M. Cone Research Fund.

The reported incidence of dissecting aneurysm varies from 0.1 to 1.1 per cent, the average being 0.26 per cent. At the University Hospital in 3129 consecutive autopsies there have been twelve dissecting aneurysms, giving an incidence of 0.38 per cent. In 2754 autopsies there were forty-six aortic aneurysms of all types. Therefore, 25 per cent of all the aortic aneurysms were dissecting. In the past, dissecting aneurysms have been considered medical curiosities and the condition rarely was diagnosed before death. Today the condition is being recognized clinically more and more frequently and statistics indicate that in the future the majority of cases of dissecting aneurysms will be diagnosed correctly. To substantiate this statement one need only note that in 1933 only seven antemortem diagnoses were made. This number has now increased to twenty-nine reported cases, and undoubtedly more diagnosed cases have remained unreported.

The greatest number of dissecting aneurysms occur between the ages of forty-five and sixty. The proportion of males to females involved is approximately two to one. In this series there were ten males and only two females. Above the age of sixty the number of females involved becomes proportionately greater and may actually outnumber the males. White patients outnumber colored patients four to one. A case has been reported in a fourteen month old male infant and one in a hundred year old female.

#### TERMINOLOGY

The lack of unanimity in terminology has caused much confusion in the literature on this subject. The term "dissecting aneurysm" is usually restricted to a condition in which there is splitting or separation of the vascular coats by an accumulation of blood. The amount of dissection varies greatly, and there is usually an associated tear in the intima and rupture through the adventitia. The term spontaneous rupture is used frequently and implies a complete localized parting of the vessel wall without separation of the individual layers. However, this rarely occurs. A close examination of the vessel reveals some degree of dissection and intramural hemorrhage in nearly all such cases. This fact has led to the interchangeable use of the terms by various investigators, but to the casual observer they must appear as entirely separate entities. If one realizes that the underlying lesion in the majority of cases is the same in both conditions, and that the difference lies only in the degree of dissection of the vessel wall, some clarification may be obtained.

#### PATHOGENESIS

The pathogenesis of dissecting aneurysms, as well as the mechanism of their formation, is not well understood and still remains a controversial subject. An excellent comprehensive review of the literature was published by Sailer (93) in which he correlated the views of innumerable investigators. His review is used as the authority on pathogenesis in this paper.



There are two theories concerning the events leading up to dissection of the vessel coats.

It was first believed that a sudden or sustained definite increase in inter-vascular pressure was sufficient to cause rupture and dissection. This increased pressure could be attributed to either endogenous or exogenous stimuli.

Klotz and Simpson (47) in their work on spontaneous rupture of the aorta attempted to determine the amount of pressure the normal aorta could stand. By using aortas from persons between the ages of twenty and forty they found that pressures of 1000 mm. of mercury would not cause rupture. Oppenheim (75) succeeded in causing the rupture of an apparently normal aorta at a pressure of 2070 mm. of mercury. The aorta of a sixty-two year old woman ruptured at the site of an atheromatous plaque at a pressure of 790 mm. of mercury. Schnurbein (96) found that the aorta of a freshly killed rabbit would withstand slightly more pressure than the aorta of a rabbit which had been dead for some time, thus proving that the aorta will not rupture more easily in life than after death. Moritz (66) attempted to cause rupture in the aortas of living rabbits by injecting fluid into the vessel under high pressure. When pressures of 800 to 1200 mm. of mercury were reached there was rupture of the portal vein or its tributaries but in no case rupture of the aorta. These facts would seem to prove that increased inter-vascular pressure alone cannot cause dissection. The hypertension frequently seen in association with a dissecting aneurysm never reaches more than a slight fraction of that necessary to rupture the aorta experimentally. The cases of spontaneous rupture occurring in coarctation of the aorta seem to give support to the theory of increased pressure. Abbott and Hamilton (2) found that spontaneous rupture occurred in thirty-eight of 200 cases of coarctation. At present there are approximately forty-two cases of rupture reported in coarcted aortas. Further investigation of recent cases, however, has revealed evidence of defects in the media of these aortas, either congenital or degenerative. In those cases of rupture occurring during labor there is also evidence of preexisting damage to the vessel wall. Hence, it becomes obvious that the role played by increased pressure must necessarily be a secondary one.

The second theory contends that there must be preexisting damage to the aortic wall before dissection can occur. All recent work supports this, but there still exists some doubt as to which of the arterial coats is chiefly concerned.

A brief review of the histology of the aorta shows that the adventitia is a thin layer composed of loose connective tissue containing a network of elastic fibers and carrying the important blood vessels, lymph vessels, and nerves. The intima is made up of lining endothelium, a thin layer of smooth muscle, elastic and connective tissue, and at its outer border a continuous

membrane, the internal elastic lamella. The media is by far the strongest of the three layers. It is composed of a complex of laminas of elastic tissue with fibrils which run obliquely and connect the laminas, thus forming a series of imperfect concentric tubes. The smooth muscle fibers form a herringbone pattern around the wall of the aorta. The muscle cells lie in the interlamellar spaces. The spaces in the fibrillar muscular layer are filled with mucoid material which acts as an adhesive and lubricant. It is evident that the media is the layer which supplies the tensile strength of the aorta and hence must be involved before dilation of the vessel can occur.

The early investigators were all of the opinion that disease of the intima was the cause of dissecting aneurysm. Laënnec believed that atheromatous changes in the intima and its primary rupture were the cause of dissection. This view was uniformly accepted until recent times, and even today numerous investigators claim that intimal disease is the initiating factor. MacCallum (60), Crowell (13), Fisher (23), and others thought that an intimal tear was necessary for the development of dissecting aneurysms. However, Peacock (78,79) showed that patients with tears in the intima did not develop dissecting aneurysms, provided the media was normal. Even if pressure in these aortas was raised extremely high no dissection occurred. Furthermore, when atheromatous ulcers of the intima are present the intimal tear usually occurs in an uninvolved area. Shennan (99,100) after reviewing over 300 cases of dissecting aneurysm, found the number in which the process began in an atheromatous ulcer to be almost negligible. Klotz and Simpson (47) also minimized the part played by alterations of the intima. Tyson (107) found no intimal tear in three of five cases of dissecting aneurysms. This occurrence has been corroborated by Mariano, Fahr, Krukenberg (49), Babes and Mironescu (4), Hamburger and Ferris (40), Reisinger (85), Mote and Carr (67), and Flaxman (25). Several of the aortas showing no intimal tear were the sites of extensive dissection. Therefore, it becomes obvious that lesions of the intima cannot play an important part in the development of these aneurysms, and that actually the intimal tear is probably secondary.

An investigation of the medial lesions leading to destruction and separation of the muscle coats revealed changes of several kinds. Some of these different changes are evidently stages in the same process. Others appear to be rather distinctive in development.

Wiesel (115) examined the aortas of young people dying a short time after the onset of an acute fulminating infection. He found a homogeneous interstitial substance between the elastic fibers and muscle cells of the media. Extension of the process resulted in destruction of either one or the other of these elements, the one destroyed seeming to depend upon the type of infection. Stoerk and Epstein (102) found destruction of the internal elastic

nellae followed by necrosis of the musculature in patients dying of influenza in 1918.

The great majority of cases showed a process which is essentially degenerative in nature.

Moriani (65) found the medial coat to be the site of numerous small scattered foci of fatty degeneration involving the elastic lamellae and muscle fibers and supporting lattice fibrils. Coalition of these areas of fatty degeneration resulted in clefts filled with amorphous debris. Hyaline degeneration of the interlamellar connective tissue has been noted in numerous cases.

Lebert (54) was the first to find inflammatory changes in the aorta. He found mononuclear infiltration and newly formed connective tissue in the outer media, the elastic tissue in this area having been destroyed. An inflammatory increase of cells and areas of necrosis in the media were observed.

Tschermak (106). Babes and Mironescu (4) reported the presence of needle shaped clefts in the media, surrounded by thickened elastic fibrils. These spaces contained colorless serous or glossy material. Fatty changes were localized here, and calcium deposition was present in the muscle. Proliferation of fibroblasts and lymphocytes and endothelial cell accumulations were prominent. Granulation tissue was present around the lymph vessels.

found in the adventitia. Hemorrhage was seen around the vasa vasorum.

Whitman and Pirie (101) found cellular infiltration and noted that the vasa vasorum were thickened and surrounded by monocytes or polymorphonuclear cells. Tyson (107) also believed that injury to the vasa vasorum plays an important part in the development of the medial lesion. In his cases he found perivascular infiltration with thickening or obliteration of the vasa vasorum. Multiple zones of hemorrhage were present around the injured and torn vessels. He claimed that this injury to the nutrient vessels may be inflammatory or sclerotic. In injury to the vasa vasorum, a disseminated cystic form of medial necrosis usually is seen.

Krukenburg (49) reported that the blood which caused the dissection of the vessel wall came from the vasa vasorum. He demonstrated fragmentation of the elastic fibers and complete dissolution of the elastic substance. Cystic areas filled with a basophilic material were present. Numerous small intramural hematomas were seen. Willis and Cragg (116) found an increased number of vasa vasorum in cases of dissecting aneurysm and considered the medial change to be caused by the impairment of the blood supply of the aorta. Whitman and Stein (114) reported a case where there was complete dissection of the media, which was filled with a clear lymphlike fluid and in which there was no tear in the intima.

Gsell (36) described a lesion characterized by focal areas of necrosis involving principally the muscle cells and progressing from simple loss of the

nuclei to complete destruction of the cell. The loss of connective tissue nuclei also occurred, and later the elastic fibers showed degenerative changes. Clefts filled with mucoid substance were present but there was no cellular reaction. Rottino (91,92) found the same type of lesion and noted healing by scar formation, with some regeneration of muscle and elastic tissue.

Erdheim (18) reported a condition to which he gave the name of "medial necrosis aortae idiopathica cystica." He claimed that the factor of prime importance in the development of dissection was the formation of numerous scattered areas of mucoid degeneration in the media. The accumulation of this mucoid substance he considered to be the forerunner of tissue destruction. There is an increase in this homogeneous, pale staining, basophilic acellular material in the media between muscle cells and elastic fibrils. It is more noticeable in the ascending aorta and shows an affinity for fast blue. Shultz has shown that this chromatrophic substance becomes more prominent with increasing age. In some cases an excess of this material is present in the aorta as a result of developmental disturbances. This is commonly seen in the presence of coarctation of the aorta and other developmental anomalies. The medial damage in these cases of medial necrosis varies from small accumulations of chromatrophic substance to the formation of large macroscopic cysts. With progression and cyst formation the chromatrophic substance becomes serous. The largest cysts are seen in the outer one-third of the media. In early stages intra- and extracellular fatty droplets are seen as well as calcium deposition. These disappear when cyst formation occurs. There may be attempts at repair with muscle hyperplasia and fibroblast proliferation. The fibroblastic reaction occurs in cystic areas. The newly formed tissue, however, is of poor quality and soon undergoes degeneration with the reformation of cystic spaces.

Thoma (104) thought that the discontinuity of the elastic tissue is attributable to angiomalacia.

Cases showing focal necrosis with mucoid collections and cyst formation have also been reported by Cellina (10), Moritz (66), Levinson, Neuburger, Wolff (118), Narr and Wells (68), Roberts (88), Schattenberg and Zeskinen (95), Rottino (91,92), Glendy, Castleman, and White (31), Kountz and Hempelmann (48), Flaxman (25), Mote and Carr (67), Shennan (99,100), Klotz and Simpson (47), Wenger (113), Logue (58), and others.

The pathologic accumulation of chromatrophic substances within the wall appears to take place in two different ways. It may result from the overproduction of normally present interlamellar ground substance, with encroachment on and replacement of adjacent muscle, elastic and collagenous elements, as seen in developmental anomalies and physiologic aging. In another group the chromatrophic substances appear to accumulate following primary degeneration or necrosis of the muscle, elastic or other elements of



the media. Here they act as a filling substance and replace tissue elements initially destroyed by other means.

Regardless of the type of medionecrosis present, the greatest destruction is found in the ascending and transverse aorta, and it is here that dissection practically always begins. It should be noted that the vasa vasorum supply is greatest in this portion of the aorta.

Roberts (88) in 1939 collected reports of twenty-seven cases of dissecting aneurysm showing typical cystic medionecrosis. Approximately twenty-five more cases have been added since then.

#### MECHANISM OF DISSECTION

The lesion in the aorta consists grossly of a splitting or separation of the media. This splitting usually occurs in the external one-third of the media. The inner wall of the aneurysm is formed by the intima and inner two-thirds of the media. The outer wall is formed by the external one-third of the media and the adventitia. It seems probable, in view of the prerequisite medial changes, that the hemorrhage in the vessel wall originates from the vasa vasorum. Bleeding from these vessels produces an intramural hematoma. Pressure in the aorta, acting on this hematoma, causes it to spread in both directions along the weakened media and dissects the wall. Hence, the transverse supra-auricular tear in the intima represents the site of emergence of blood, rather than the point of origin of the dissection. The dissection of the vessel wall usually begins in the ascending aorta. The amount of dissection varies from the minimal separation of the coats seen in spontaneous rupture to involvement of the entire length of the aorta and its main tributaries. It may be limited to a few centimeters on one side of the vessel or may extend to complete separation of the entire circumference throughout the length of the aorta. In 30 per cent of the cases the dissection is confined to the ascending or transverse aorta; in 35 per cent the abdominal aorta is involved. Gardner, Galbraith, and Hardwick (30) reported a case in a fifteen year old boy in which dissection extended to the lower border of both popliteal arteries. Any of the larger branches of the aorta may be involved. The carotid, subclavian, renal, and iliac arteries commonly show extension of the dissection. In widespread separation of the aorta coats, the intercostal and lumbar arteries are commonly torn across. In large dissections the extension of the hematoma in the vessel wall proceeds almost entirely in the centrifugal direction, propelled by and following the column of circulatory blood within the lumen of the vessel. In some instances, however, the blood seems to have progressed in a centripetal direction.

In the majority of cases there is an associated tear in the intima. This is frequently clean cut and transverse. It usually occurs in the ascending aorta within 2 to 4 cm. of the aortic cusps. Osgood, Gourley and Baker (76)



found 70 per cent of intimal tears in the ascending, 20 per cent in the transverse, and 10 per cent in the descending aortas. Ten per cent of the cases show multiple tears in the intima. The consensus of opinion is that the tear is usually transverse above the aortic cusps because of the presence of a band like thickening of the pericardium which passes from the pulmonary artery to the ascending aorta, thus causing a fixation of the aorta at this point. The remains of the ductus arteriosus adds to the strength of this band which becomes thickened in middle life and forms true *vincula aortae*. With the remainder of the aorta being mobile, rupture would naturally occur at the point of fixation. Löffler (57) pointed out that during diastole there is an abrupt recoil, which causes longitudinal stretching of the aorta. This forces the ascending portion downward and puts an added strain on the point of fixation. Oppenheim (75) thought that the bursting tension is in direct proportion to the radius of the vessel, and since the ascending portion of the aorta has the largest circumference, the tension is greatest here.

A second perforation of the intima may occur distal to the usual site through which blood may reenter the lumen. This results in the formation of a healed or an arrested dissecting aneurysm. These patients may live until the finding of the aneurysm may be coincidental following death from other causes. Numerous cases have been reported in which several dissecting aneurysms occurred, each at a different time and each going on to healing. In these cases of arrested aneurysm one of two things usually happens; either the new lumen becomes filled with thrombus and undergoes organization and scarring or the new lumen becomes lined by endothelium and produces a true double-barreled aorta. Peery (81) reported eighty cases of arrested aneurysm. Since then twenty more cases have been added to the literature. Weiss, Maher, and Kinney (112) estimated that healing occurs in 10 per cent of the cases of total dissecting aneurysm. They described cases in which not only endothelial proliferation occurred, but atheromatous changes and even calcareous plaques were present in the new channel. Graham (33) reported the case of a patient who lived thirty years following development of a dissecting aneurysm.

Other cases of healed or arrested aneurysm have been reported by Sherman (100), Hall (38), Frothingham, Sanderson, and Hazard (27), Mote and Carr (67), Flaxman (25), Graybiel and Sprague (35), Wenger (113), and Frei.

In those cases in which the new lumen becomes filled with thrombus and undergoes scarring, the intima may show the wrinkled and scarred tree bark appearance usually seen in syphilis.

The adventitial rupture which is responsible for the sudden death that occurs in 95 per cent of these cases may take place at any point. Rupture into the pericardium with resulting cardiac tamponade occurs in 70 per cent.

of the cases. Twenty per cent rupture into the left pleural cavity and 5 per cent into the mediastinum. Hemorrhage into the esophagus, bowel, stomach, retropleural and retroperitoneal spaces has been reported.

#### ETIOLOGY

The etiology of the dissecting aneurysm is still a problem. No single causative agent of clinical disease can be demonstrated as consistently causing the morbid changes leading to dissection of the aortic wall.

Congenital defects in the formation of the media undoubtedly are responsible for a small percentage of these aneurysms. Such cases show a deficiency or failure of one or more tissue elements. Primary overproduction of the normal mucoid material has been suggested as being responsible for the medial weakness. In these there are usually associated vascular defects, such as coarctation of the aorta or valvular anomalies.

Arteriosclerosis has been discounted almost completely as the cause of dissecting aneurysms. The consensus of opinion today is that arteriosclerosis may in a few instances be responsible for dissection. In these cases, however, the dissection begins in the abdominal aorta, is limited in extent, does not perforate the adventitia, rarely causes clinical symptoms, is not fatal, and represents merely an insignificant finding at autopsy on a patient dying from some other condition.

Hypertension is present in the majority of cases of dissecting aneurysm. However, its role is apparently a secondary one and may well represent effect rather than cause. The fact that renal disease is frequently present and the numerous cases of dissection occurring during labor in pregnant women would seem to lend weight to the role played by high blood pressure. Closer examination of such cases in recent years, however, has revealed typical medionecrosis. Therefore, the fact remains that there must be disease of the media before dissection can occur, and this medial destruction cannot be attributed to the elevated blood pressure.

Severe systemic infections such as typhoid fever, rheumatic fever, and influenza may lead to aneurysm formation in a limited number of cases.

Syphilis attacks the media and causes definite destruction. However, it cannot be considered the cause of dissecting aneurysm. In fact, syphilitic mesaortitis, by causing destruction of the normal architecture and marked fibrosis, would tend to prevent splitting of the vessel wall rather than to cause dissection.

The presence of circulating toxins may be the true etiologic factor in dissecting aneurysms. The conclusion of Shennan that the medial degeneration arises "as a result of toxic insults of varying character sustained during life," seems well founded. By experimental means medial necrosis has been shown in rabbits that have been fed large doses of nicotine. Diphtheria

toxin causes medial degeneration, as do the uremic toxins. Repeated doses of epinephrine given to rabbits causes typical medial lesions, with the formation of both saccular and dissecting aneurysms. It must be recognized that the response of rabbits to this drug is variable, as shown by the reports of Josue (44), Fisher (23), Kulb (50), Zeigler, and Erb. The epinephrine seemed to have a direct toxic action on the vessel, to injure the vasa vasorum, and to cause a transient hypertension.

Leary and Weiss (53) found that massive doses of viosterol caused medionecrosis but no dissection. The viosterol, of course, caused no hypertension, which may account for the dissection being present in one case and absent in the other.

Recently histamine shock has been found to cause medial degeneration. High cholesterol intake and vitamin deficient diets are believed to play a part in medial necrosis.

The theory of toxemia is given more weight by the finding of a dissecting aneurysm of the inferior thyroid artery by Wegelin (109) in a patient having thyroid disease and dying of eclampsia. Along this same line Kountz and Hempelmann (48) reported three cases of aortic rupture as a result of medionecrosis following thyroidectomy. This suggests endocrine disturbance as a possible factor in causing the degeneration of the media. It may be that the cases of dissecting aneurysm occurring at the time of labor are further proof of the endocrine origin of medionecrosis, since hormonal activity is at its height during pregnancy.

#### CLINICAL MANIFESTATIONS

The clinical signs and symptoms of dissecting aneurysm are extremely variable. They may simulate those of practically any other cardiovascular lesion. The clinical symptoms of the smaller dissections and of those that go on to healing naturally are somewhat different from those seen in the acute fatal type. In the early stages, however, they are all practically identical.

*Symptoms.* The patient often gives a history of previous high blood pressure. He is usually engaged in some activity at the time of onset. This may vary from violent physical exertion to the slightest muscular activity. Such factors as excitement, anger, straining at stool, and sexual intercourse have been recorded as causing the attack. There is a sudden onset of symptoms, which are severe. In rare cases the onset is insidious.

Pain is the most common initiating symptom. It is generally localized behind the lower sternum or in the epigastrium. It may radiate to the back, down into the abdomen, up along the sternum, into the neck, or down into the legs, but rarely into the arms. In no two cases is the radiation the same. The pain is usually intense and excruciating, and is often described as tear-

ing, stabbing or knifelike. In other instances it is mild, dull or aching, and in 10 to 15 per cent there is no pain. When pain is present it may subside in a few hours or may last for days. In some cases the distribution of the pain corresponds exactly with the progression of the dissection.

Dizziness, fainting, syncope, or complete loss of consciousness often appear early or may be the presenting symptom. Recovery from the initial fainting usually follows within one-half to one hour. Dyspnea is usually present and may be extreme. In some cases pain is increased by respiration.

Nausea and vomiting are frequent early symptoms.

The initial syncope is not attributable to the loss of blood in most cases. Weiss (111) reported that the involvement of the depressor nerve endings in the arch of the aorta is responsible. The dyspnea, nausea, and vomiting are also reflex in type, caused by the stretching and tearing of the first part of the arch of the aorta.

Shock and collapse frequently occur early.

The further development of symptoms, after the initial attack, depends entirely upon the nature and extent of the dissection, and on the time and location of the final rupture. In many patients there is a stage following the onset in which the patient is fairly comfortable and the signs of shock disappear. This is usually followed by sudden death. Following some slight exertion the patient screams out in pain, gasps once or twice, and dies.

In those cases which go on to healing there is gradual improvement of all signs and symptoms, until little or no evidence of any organic disease remains.

*Physical signs.* When first seen the patient is generally in shock. He is frequently comatose. The skin is cold and clammy and covered with perspiration. The lips are often cyanotic, and the cyanosis is not relieved by oxygen. The respirations are rapid. Yet in spite of all the signs of shock and collapse, in most instances the blood pressure remains elevated and the pulse rate is normal or only slightly elevated. As the case progresses the pressure has a tendency to fall, and in a few patients it is low from the beginning. The heart is enlarged to percussion, 85 per cent of the cases show cardiac hypertrophy, and there is increased retromanubrial dulness. There may be palpable in the posterior chest a pulsating mass which spreads laterally. In many cases harsh rasping murmurs appear over the heart early in the condition. Usually there have been no previous murmurs. These murmurs may be systolic or presystolic but are most frequently diastolic. Evidence of aortic regurgitation is often present. The diastolic murmur may be caused by the leakage of blood from the main arterial channels into the accessory channels formed by the aneurysm. Another explanation is that simple distention of the first portion of the aorta renders the valves incompetent. Weiss claimed that incomplete rupture causes a change in the



relative positions of the aortic cusps, thereby preventing normal approximation of the cusps and resulting in murmurs. In the presence of regurgitation the patient may show signs of progressive decompensation and die of congestive heart failure, as reported by Gouley and Anderson (32). The most important vascular signs are those caused by occlusion of branches of the aorta, with the resulting ischemia. Compression or occlusion of a coronary vessel leading to localized myocardial ischemia occasionally occurs. Associated with this there may be arrhythmia, fibrillation, or bundle branch block, as reported by Logue (58). If the carotid artery is involved, coma results followed by typical hemiplegia with all the associated signs. Pressure of the aneurysm in the mediastinum may lead to aphonia, dysphagia, unilateral dilatation of the pupil, and compression of the veins with engorgement of the vessels and cyanosis of the face and neck. Considerable difference in the blood pressure in the arms or complete obstruction of the blood supply to one or both arms is common. The venous pressure may be different in the two arms. As mentioned previously, the intercostal and lumbar arteries frequently are severed. This cuts off the blood supply to the cord and causes ischemia, which results in many types of bizarre neurologic findings in the trunk and lower extremities. The injury to the cord accounts for the selective paralysis which is often present, and may also account for the distribution of the pain. Pleural effusion may appear early, usually on the left side, and hemoptysis is common. The abdominal aorta may become tender, and at times the aneurysmal dilatation is palpable. Distention with signs of intestinal obstruction may occur. Involvement of the renal arteries leads to anuria or hematuria. One of the commonest and most characteristic findings in dissecting aneurysm is the interference with circulation of the legs. The pulse may be lost in one or both legs but after a while it may return. Complete occlusion of both iliacs by dissection or thrombosis or both is not unusual. The legs become cold, cyanotic, and flaccid, and any type of neurologic finding may be present.

A sudden and rapid change for the worse in the general condition of the patient usually means rupture through the adventitia with fatal hemorrhage. The signs will depend on the point of rupture. One of the most common is the development of a cardiac tamponade with its usual clinical findings resulting from perforation of the aneurysm into the pericardium.

*Laboratory findings.* There is frequently an elevation of temperature. This may vary from 99 to 102 F. and, if the patient does not succumb, usually lasts several days. The blood shows a progressive normocytic anemia. There is both relative and absolute leukocytosis in the majority of cases. The white blood count varies from 9000 to 34,000, frequently being above 20,000, the increase being in polymorphonuclears. The fever and leukocytosis are probably caused by the beginning organization of the clot in the sac.



The icteric index is elevated and may remain so for as long as two weeks. In some cases actual clinical icterus is present. The urine may show albuminuria, pyuria, hematuria or cylindruria.

The roentgen ray findings vary from normal to the most unusual symptoms. There is usually widening and deformity of the supracardiac shadow. There may be fusiform dilatation of the descending aorta, with a darker center and lighter peripheral shadow. An arcuate shadow may extend outward from some point in the aortic arch. This shadow may or may not pulsate. Shadows caused by dissection along one or more large branches of the aortic arch are sometimes seen and when present are pathognomonic. The heart is enlarged, the trachea and esophagus may be displaced, and fluid is frequently present in the left chest. Collapse of the left lung has been reported.

In those cases having pleural or peritoneal effusion, tapping reveals the fluid to be clear, slightly bloody, or grossly bloody.

The electrocardiogram usually shows a left axis deviation and a changed T wave. However, except in those cases of compression of the coronary arteries, the electrocardiographic findings differ from those of coronary thrombosis.

#### DIFFERENTIAL DIAGNOSIS

*Coronary thrombosis* is the condition with which dissecting aneurysm is most commonly confused. Among the findings which serve to differentiate the two are: the history of previous angina in most cases of coronary thrombosis, but not in dissecting aneurysm; the sudden overwhelming tearing pain in the aneurysm in contrast to the more gradually developing constricting pain of thrombosis; the widespread location and radiation of the pain in aneurysm which rarely extends into the arms, as compared to the more localized pain generally radiating into the left arm; the early loss of consciousness in aneurysm, rare in thrombosis; the persistence of hypertension and normal pulse rate even though the patient is in collapse in aneurysm, against the fall in blood pressure and rapid or irregular pulse in thrombosis; the sudden appearance of aortic murmurs, especially diastolic, where previously there were none, with evidence of aortic regurgitation not seen in coronary occlusion; the presence of complete or partial obliteration of one or more of the large arteries with loss of arterial circulation to some part of the body, not seen in coronary disease; the unusual neurologic findings, varying from paresthesias to complete paralysis, seen in aneurysm but not in coronary occlusion; the absence in aneurysms of auricular fibrillation, pericardial friction rub, and characteristic electrocardiographic findings usually seen in coronary occlusion; and the roentgen ray findings of the widened aorta, and similar conditions in dissecting aneurysm.

*Embolism*, especially of the axillary, iliac, cerebral, or pulmonary arteries,

is likely to be confused with dissecting aneurysm. The location and severity of the pain, the suddenness of onset of trouble without previous evidence of disease of the heart or veins which might provide a source for embolism, and the associated neurologic and roentgen ray findings should distinguish the aneurysm without much difficulty.

A dissecting aneurysm of the abdominal aorta is sometimes mistaken for any abdominal emergency requiring surgical intervention. The suddenness of onset, the character of the pain, the vascular signs, the neurologic findings, the hypertension, and the diffuse manifestations of the aneurysm should differentiate these two.

*Pneumonia* is frequently diagnosed when a dissecting aneurysm is present.

The suddenness of onset, the severe pain, the absence of pulmonary consolidation, the low fever, and the lack of cough should quickly rule out the diagnosis of pneumonia.

#### PROGNOSIS

The prognosis in the majority of patients with dissecting aneurysm is extremely unfavorable. Statistics show that 58 to 60 per cent of these die within the first twenty-four hours; 25 to 28 per cent may survive from one to seven days. Crowell (13) claimed that 20 per cent of the patients may survive the initial episode. Weiss (110,111) estimated that 10 per cent recover with development of a healed aneurysm. However, those patients with healed aneurysms are frequently subject to subsequent attacks of dissection, any one of which may be fatal.

#### TREATMENT

If an aneurysm does not rupture, recovery may occur. Therefore, the patient should be kept absolutely quite. Large doses of morphine should be administered freely. Oxygen administration by tent makes the patient more comfortable. Fluids and nutrition should be given cautiously and slowly. The patient should be spared every muscular effort.

If the circulation to the legs is impaired an incision may be made in the intima in the iliacs, thereby connecting the end of the sac with the normal channel. This operation was performed successfully by Bulmer and Derby as noted by Gurin (37). The circulation in the legs was reestablished and was adequate until the patient died five days later from a final rupture through the adventitia elsewhere.

#### CASE REPORTS

*Case No. 1:* Autopsy No. 2392. A 41 year old colored male was admitted on March 16, 1936 and died on March 18, 1936.

This patient had been admitted to the hospital on two previous occasions with a diagnosis of lues of the central nervous system and hypertension. On the night of March 13

he went to bed feeling well. The next morning he was found in a comatose state and could not be roused. He was brought into the hospital accident room after midnight, at which time he had not regained consciousness.

A physical examination revealed the patient to be deeply comatose. Respirations were slow and even. The left pupil was dilated, both pupils were fixed, and there was internal strabismus of the right eye. The trachea was in the midline. The heart was enlarged to percussion, rhythm was regular, and rate rapid. No murmurs were heard. The blood pressure was 240 mm. of mercury systolic and 180 mm. diastolic. There were râles at both lung bases. The deep reflexes were hyperactive in the upper extremities, but knee kicks and ankle jerks were absent. There was a suggestion of Babinski's reflex; Oppenheim's and Chaddock's signs were positive, and Kernig's sign was negative.

*Laboratory findings:* Chemical examination of the blood showed red blood cells 7,000,000, white blood cells 13,320; hemoglobin 115%; nonprotein nitrogen level 90 mg. %; blood sugar level 112 mg. %. The results of the Kolmer and Kahn tests for syphilis were negative. The spinal fluid was clear, pressure 65 mm. water.

The patient roused slightly after admission; following a spinal tap and the withdrawal of 500 cc. of blood from his vein he lapsed back into a coma and died on March 18 at 6:30 A.M.

*Clinical diagnosis:* Hypertensive cardiovascular disease with cerebral edema; syphilis of central nervous system; syphilitic endarteritis.

*Autopsy findings:* A dissecting aneurysm involving 3 to 4 cm. of the ascending aorta was found. The aneurysm had ruptured into the pericardium, which contained 500 cc. of liquid and clotted blood. There was a transverse tear in the intima just above the commissural attachments. The commissural attachment between the right and posterior cusps was fractured, thereby rendering the valve incompetent. The heart was hypertrophied. There was interstitial hemorrhage into the mediastinum and hilum of the right lung. Intracerebral and intracerebellar hemorrhages with rupture into the ventricle, and internal hydrocephalus were present.

The aorta showed dissection in the external third of the media. Microscopically there was hyaline degeneration of the media with destruction of the elastic tissue. There were numerous small focal areas of hemorrhage around the vasa vasorum. The vasa vasorum showed thickening. No cellular infiltration was present. The kidneys showed moderate nephrosclerosis.

*Case No. 2:* Autopsy No. 2800. The patient, a 54 year old white female, was admitted on October 25, 1936 in an unconscious state. Her family reported that she had been well until eighteen hours prior to admission. At that time she suddenly complained of the loss of control of her right side, and fainted. She was given first aid but did not respond. The family physician was summoned and made a diagnosis of "stroke."

Following admission to the hospital the patient regained consciousness. She showed weakness of the left side of the face and her tongue protruded to the left. Her speech was normal. She gave a history of hypertension of one year's known duration. She had some dyspnea. As preparations were being made for a physical examination the patient asked for a drink of water. Immediately after drinking she cried out in pain, fell back in bed in a convulsive type seizure, took a few gasping breaths, and died.

*Clinical diagnosis:* Hypertensive cardiovascular disease; cerebral hemorrhage.

*Autopsy findings:* A dissecting aneurysm beginning at the base of the aorta and extending to a point 1 cm. beyond the left subclavian artery was revealed. There was a transverse tear in the intima 2 cm. above the aortic valve which almost completely encircled the vessel. The media was dissected in its outer third. There was rupture of the adventitia with hemorrhage into the pericardium, which contained approximately 800 cc. of blood. Dissection had involved the innominate artery, with partial occlusion



of the right carotid artery. Microscopically the aorta showed destruction of the elastic tissue in the outer media, with hyalinization and cellular infiltration. There was cystic degeneration, and loss of both muscle and elastic tissue. The cystic area contained clear homogeneous material in which there was beginning fibroblastic proliferation.

*Case No. 3: Autopsy No. 2981.* A 57 year old white female was admitted on July 31, 1940. She complained of abdominal pain of four days' duration. Three years prior to admission she had been found to have hypertension. At that time she had dyspnea and attacks of pain over the heart which were relieved by sodium nitrite.

On July 27 the patient developed pain which began in the epigastrium and radiated to the back and left flank. It was severe and stabbing and was accompanied by dyspnea.

A physical examination revealed the heart to be enlarged to the left, with systolic mitral and aortic murmurs. Her blood pressure was 230 mm. of mercury systolic and 100 mm. diastolic. The heart rhythm was regular and the rate was 80. There was a mass palpable in the epigastrium. A roentgenograph showed the cardiac enlargement and some abnormality of the aortic shadow. The electrocardiogram revealed left axis deviation with an inverted T wave, which denoted myocardial injury and probable coronary disease.

*Laboratory findings:* Chemical examination of the blood showed red blood cells 4,420,000; white blood cells 21,400; hemoglobin 92%. The urinalysis showed +2 albumin and 5 to 10 red blood cells per high power field. The serologic test for syphilis was negative.

The patient was kept at bed rest and given sedatives for her pain. The heart lesion improved clinically. On August 10 she developed severe pain in the left upper quadrant of the abdomen. This was relieved by nitroglycerin but recurred more and more frequently. Large doses of opiates were eventually required to control the pain. On August 29 she became comatose and died three days later, September 1.

*Clinical diagnosis:* Hypertensive arteriosclerotic cardiovascular disease; dissecting aneurysm, descending aorta; cardiac hypertrophy and dilatation; coronary insufficiency.

*Autopsy findings:* A dissecting aneurysm was revealed which began in the descending portion of the arch of the aorta and extended 1 cm. beyond the orifices of the common iliacs. An oblique tear of the intima was present at the upper end of the dissection. There was dissection and thrombosis of the left renal artery. No rupture of the adventitia was present. There was considerable atherosclerosis and cardiac hypertrophy. Microscopically the aorta showed thickening of the subendothelial tissue, with calcium deposition and definite fibrosis. The media was thinned and atrophic. Areas of hyaline degeneration with destruction of the elastic tissue were present. The vasa vasorum were thickened and showed perivascular round cell infiltration. The kidneys showed advanced nephrosclerosis.

*Case No. 4: Autopsy No. 3256.* The patient, a 60 year old white male, was admitted on December 26, 1941 in an unconscious state. His wife reported that he suffered for years with "lumbago." He was told that he had high blood pressure and heart trouble. On December 12 he complained of severe pain in the back. The family physician felt a pulsating mass in his left lower quadrant and advised a roentgenographic examination, but he refused to have this done.

At 8:00 P.M. on December 25 the patient had a sudden severe pain in the lower lumbar region. The systolic pressure at that time was 180 mm. of mercury. He was given a sedative and felt more comfortable. Two hours later he became acutely ill. An examination showed him to be in a state of collapse. He complained of severe pain in his lower back and the left side; he was pale and dyspneic. His pulse rate was 35 and the systolic pressure had fallen to 40 mm. of mercury. At 2:00 A.M. the patient still complained of pain in his back. A pulsating mass was palpable in the left lower quadrant and abdominal distention was present. He was given a second dose of  $\frac{1}{2}$  gr. of morphine sulfate, but the pain persisted until he lost consciousness.

The patient did not rouse after admission to the hospital. He was given 500 cc. of intravenous glucose. His face suddenly became flushed and cyanotic; he took a few gasping breaths and died.

*Laboratory studies* revealed the following: hemoglobin 74%; white blood cells 20,500; serologic test for syphilis negative. Hemoglobin 18%; white blood cells 32,400; spinal fluid negative.

*Clinical diagnosis:* Dissecting aneurysm, aorta, with rupture into the retroperitoneal space; hypertensive cardiovascular disease.

*Autopsy* was limited to exploration and examination of the abdominal viscera. A fusiform dissecting aneurysm of the abdominal aorta measuring 9 by 13 cm. was found extending 1½ cm. down the iliac arteries. The adventitia was ruptured anteriorly at the level of the second lumbar vertebra. The renal vessels were involved in the dissection. There was a large retroperitoneal hematoma present which extended into the descending and sigmoid mesocolon.

*Case No. 5:* Autopsy No. 4187. A 17 year old white male was admitted on November 3, 1943 and died the same day. The patient became ill while playing football on the afternoon of November 2. Following a touchdown run in which he was not tackled he complained of pain in his lower abdomen. While being taken to his quarters he collapsed and was carried the rest of the way. He was seen shortly afterward, 4:00 P.M., by the school physician. At that time he complained of pain in the lower abdomen and numbness in the legs, mainly the right. His abdomen was not tender, there was no muscle spasm, nausea or vomiting. The temperature and respirations were within normal limits. He was seen again at 6:00 P.M. and at midnight. His temperature, pulse and respirations remained normal. At midnight the blood pressure was 160 mm. of mercury systolic and 90 mm. diastolic. He showed no evidence of being acutely ill and was given a small dose of barbiturate.

When seen at 6:00 A.M. the next morning the patient appeared to be in shock. His skin was cold and clammy, the mucous membranes were pale, and the pulse was elevated. The temperature was 101 F. Both lower extremities were cool and appeared cyanotic. At this time the patient complained of pain in the abdomen, numbness in the legs, and inability to move the legs. There was also pain in the posterior thoracic region.

The patient was sent immediately to the hospital and on admission looked pale and appeared shocked. The pulse was weak and thready. The blood pressure was 165 mm. of mercury systolic and 90 mm. diastolic. A soft bruit was audible in the third left interspace during both the systole and the diastole. There was a wide area of dullness in the thoracic region to the left of the midline both anteriorly and posteriorly. No râles were heard. The abdomen was distended and tender. The right leg was cool and cyanotic, and there were no pulsations palpable in either leg. There were atypical sensory disturbances in both legs, more severe on the right. Babinski's reflex was negative, knee kicks and ankle jerks were absent, and there was a foot drop on the right.

A roentgenogram of the chest revealed a mediastinal mass extending from the third thoracic to the lower thoracic region.

*Laboratory findings:* Chemical examination of the blood showed red blood cells 3,364,000; white blood cells 16,250; hemoglobin 75%; hematocrit 31. Urinalysis showed +2 albumin and 5 to 10 white blood cells.

At 2:30 P.M. the patient was given 250 cc. of citrated blood and ¼ gr. of morphine sulfate and placed in shock position. At 5:00 P.M. his blood pressure was 105 mm. of mercury systolic and 70 mm. diastolic on the left, and 130 mm. of mercury systolic and 60 mm. diastolic on the right. The pulse rate was 144. Two hours later the blood pressure could not be obtained and there was no pulse rate. He was given 500 cc. of citrated blood and placed in an oxygen tent. There was some improvement and the blood pressure returned to 120 mm. of mercury systolic and 70 mm. diastolic. At this time pulsations in





FIG. 1. Dissecting aneurysm in Case No. 5. Multiple tears in the intima are shown, also dissection of the media and massive infiltration of blood into surrounding tissues.

the left leg could be felt for the first time. No pulsations could be felt on the right. The hematocrit reading was 28.2.

At 10:00 P.M. the patient became cyanotic and respirations were rapid and shallow. The hematocrit reading at this time was 27, the hemoglobin 60%. He died at 11:05 P.M.

*Clinical diagnosis:* Dissecting aneurysm, aorta; retroperitoneal hematoma; retropleural hematoma.

*Autopsy* revealed a dissecting aneurysm extending from the base of the heart down to and involving 3 cm. of the iliac vessels. There was a complete intimal tear at the level of the eleventh thoracic vertebra, and multiple other intimal tears which were confined mostly to the lower thoracic region. In the abdominal aorta there were several intimal tears which communicated with the orifices of the intercostal arteries. The iliac vessels were closed by thrombi. There was rupture through the adventitia at the level of the twelfth thoracic vertebra. The left pleural cavity contained 700 cc. of blood-tinged fluid and the right 500 cc. of the same. There was a large retropleural hematoma filling about one-third of the left chest cavity. A large retroperitoneal hematoma covered the posterior abdomen and extended down into the pelvis. This hematoma filled the pelvis and extended up, extraperitoneally, over the anterior abdominal wall.

The aorta was preserved as a museum piece and serial sections were not made. The sections which were cut showed thinning of the media and hyaline degeneration of the interlamellar connective tissue. The vasa vasorum were slightly thickened and there was round cell infiltration around the vessels. In one small area mucoid degeneration was seen.

*Case No. 6:* Autopsy No. 4226. This patient, a 63 year old white male, was admitted on December 29, 1943 with the complaint of pain in his back and weakness of the right arm of one-half hour's duration. He felt well until the sudden onset of this pain.

While at work the patient tried to lift a heavy piece of machinery. He developed a sudden pain in the middorsal region and a few minutes later collapsed. He was brought immediately to the hospital.

Examination showed the patient to be in shock. His skin was cold and clammy, the mucous membranes were pale, and respirations rapid. He was fully conscious. The blood pressure was 190 mm. of mercury systolic and 90 mm. diastolic in his left arm. He complained of weakness of the right arm which was cooler than the left, cyanotic, and had no palpable pulsations. The heart sounds were distant but regular, with a rate of 52 per minute. After being given  $\frac{1}{2}$  gr. of morphine sulfate the patient was sent to the ward. A reexamination revealed a systolic and diastolic blow over the precordium. The blood pressure in the left arm still was 190 mm. of mercury systolic and 90 mm. diastolic. The right arm at this time was definitely cyanotic, cold, and pulseless. The right carotid pulse was palpable but there were no pulsations in the axillary artery. The patient died within a half hour after admission.

*Clinical diagnosis:* Embolism of the right brachial artery; pulmonary embolism.

*Autopsy findings:* A dissecting aneurysm was found extending from the base of the heart down to and including 2 cm. of each common iliac artery. There was a horizontal tear of the intima 2 cm. above the aortic valve, and a longitudinal tear of the adventitia just above the base of the heart, with hemorrhage into the pericardium and cardiac tamponade. Microscopic sections showed typical degenerative necrosis of the media. Both the elastic tissue and muscle cells were destroyed. These were replaced by a homogeneous mucoid material which was slightly basophilic. This mucoid substance was present in cystic collections in the outer media. There was no evidence of repair by fibroblastic elements.

#### SUMMARY

There are at present 579 cases of spontaneous dissecting aneurysm reported in the literature, fifty-nine of which have been diagnosed clinically. The proportion of males to females involved is two to one. The proportion of white to colored patients is four to one.

Injury to the media is necessary before dissection can occur. This injury is usually degenerative in type. Five types of medial necrosis are noted: 1) fatty degeneration of the elastic tissue with subsequent involvement of the supporting structures; 2) hyaline degeneration of the interlamellar connective tissue; 3) exudative lesion of the media, the muscle and elastic tissue being replaced by granulation tissue; there is accompanying cellular infiltration and inflammatory or sclerotic injury to the vasa vasorum; 4) primary muscle degeneration varying from simple nuclear loss to complete destruction of the muscle cells and secondary involvement of the adjacent structures; 5) the "medio-necrosis aortae idiopathica cystica" of Erdheim, with overproduction of mucoid ground substance and cyst formation.

The etiology of the dissecting aneurysm is not known. Congenital defects are responsible in a small percentage of cases. Severe systemic infections may occasionally be a causative factor. Arteriosclerosis and syphilis are definitely not causative agents and hypertension must play only a secondary role. Recent evidence seems to indicate that circulating toxins are the cause of the medial necrosis. These toxins may be exogenous, attributable to diet, drugs, and similar factors, or endogenous, caused by uremia and thyroid disease, in type.

The symptoms and signs of dissecting aneurysms are variable, but if the possibility of such a condition is kept in mind the diagnosis should be relatively simple.

One out of every ten patients with dissecting aneurysm recovers and goes on to healing.

In 3129 autopsies at the University Hospital there have been twelve cases of dissecting aneurysm. The six cases that have occurred since the ones reported from this hospital in 1934 are included in this paper. Three of these six cases were diagnosed clinically before death. Of the six patients reported four were males and two females; five were white and one colored. Their ages ranged from seventeen to sixty-three years. An intimal tear was present in all cases. In one case an adventitial rupture did not occur. Three patients died of cardiac tamponade following rupture of the aneurysm into the pericardium.

Several of the aortas were preserved as museum specimens and serial sections were not made. However, the sections taken in nearly every case showed typical degenerative lesions in the media.

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# ANNUAL REPORT OF THE DEPARTMENT OF OBSTETRICS, SCHOOL OF MEDICINE, UNIVERSITY OF MARYLAND FOR 1942 AND 1943\*†

## FOREWORD

At the close of 1942 conditions were such that an annual report did not appear feasible. However, the figures were kept and a combined report of 1942 and 1943 is now presented. Because of the increased amount of work to be done with a somewhat depleted staff this report is not as complete as those which preceded it, but it is felt that it is a fair representation of what has happened.

There are two points to which attention might be called: first, the total number of patients delivered has increased from 1996 in 1939 to 3062 in 1943, an increase of 53 per cent. This has been accompanied by a reduction in the visiting and house staffs and a decided reduction in the nursing personnel. In view of improved economic conditions generally the greatest proportion of this increase was in private patients, 586 in 1939 and 1369 in 1943. Secondly, the uncorrected fetal mortality, including stillbirths, full term and premature, and deaths in live born babies for each of the five years from 1939 through 1943 has been 4.06, 5.29, 5.57, 5.36 and 3.95 per cent.

A comparative table of maternal mortality for the last six years is to be found at the end of this report and needs no comment here.

Once more, as in previous years, sincere thanks are extended to those members of the visiting and house staffs, to the nurses and to the secretarial force, whose unremitting and cheerful labor and cooperation have made this report possible.

LOUIS H. DOUGLASS, M.D.  
*Professor of Obstetrics*

Total number of patients delivered and discharged (twins 55 sets—triplets 1 set) not including abortions.....	6053
Delivered in homes (twins 9½ sets).....	2270—37.5%
White.....	190
Colored.....	2080
Registered.....	2066
Unregistered.....	204
Delivered in hospital (twins 45½ sets—triplets 1 set).....	3783—62.5%
White.....	2865
Colored.....	918

Note—One patient with twins was delivered of the first baby at home and the second at the hospital.

\* From the Department of Obstetrics, School of Medicine, University of Maryland.

† Received for publication May 16, 1944.

Total number of deliveries (twins 5 sets—delivered by section).....	6105
White.....	3088
Colored.....	3017
Normal spontaneous.....	3221—52.76%
White.....	736
Colored.....	2485
Operative deliveries (all in hospital).....	2884—47.24%
Forceps deliveries.....	2550—41.74%
White.....	2117
Colored.....	433
High.....	0
Mid.....	27
Presentation, occiput posterior.....	8
Delivered as such.....	3
Delivered following rotation.....	5
Manual rotation.....	1
Scanzoni maneuver.....	4
Presentation, occiput transverse.....	12
Forceps rotation.....	8
Manual rotation.....	4
First twin.....	1
Presentation, face.....	1
Dystocia, cervical.....	1
Inertia, uterine.....	1
Disproportion, cephalopelvic.....	1
Second stage—prolonged.....	2
Low.....	2523
Control.....	1954
Presentation, occiput posterior.....	191
Delivered as such.....	114
Delivered following rotation.....	77
Spontaneous rotation.....	5
Manual rotation.....	39
Forceps rotation.....	33
Presentation, occiput transverse.....	334
Spontaneous rotation.....	21
Manual rotation.....	193
Forceps rotation.....	118
As such.....	2
Presentation, face.....	6
Toxemia.....	11
Labor, prolonged.....	17
Labor, premature.....	8
Rheumatic cardiovascular disease....	2
Breech extraction.....	178—2.92%
White.....	130
Colored.....	48
Internal podalic version and breech extraction.....	10—0.16%
White.....	8
Colored.....	2



Presentation, transverse.....	6
Umbilical cord, prolapse of.....	1
Manual rotation of head, unsuccessful.....	1
Second twin.....	2
Cesarean section.....	138—2.26%
White.....	93
Colored.....	45
Classical.....	20
Section, previous.....	2
Disproportion, cephalopelvic.....	5
Cervix, carcinoma of.....	1
Preeclampsia, fulminating.....	1
Rheumatic heart disease.....	1
Fibroids, multiple.....	1
Placenta, previa centralis.....	5
Placenta, previa partialis.....	1
Presentation, transverse.....	1
Diabetes mellitus.....	1
Eclampsia, antepartum.....	1
Laparotrachelotomy.....	112
Disproportion, cephalopelvic.....	62
Pelvis, contraction of.....	5
Placenta, previa marginalis.....	1
Placenta, previa partialis.....	1
Placenta, previa centralis.....	9
Preeclampsia.....	7
Placenta, premature separation of..	8
Presentation, mentum posterior....	3
Cyst, ovarian.....	1
Hypertensive disease.....	1
Posteclampsia.....	1
Section, previous.....	5
Presentation, transverse.....	1
Presentation, oblique.....	1
Outlet, contraction of.....	1
Diabetes mellitus.....	1
Uterus, arcuatus.....	1
Heart disease.....	3
Extraperitoneal.....	4
Cephalopelvic disproportion.....	4
Porro.....	1
Abruptio placenta, with Couvelaire uterus.....	1
Post mortem.....	1
Death from spinal anesthesia (living baby).....	
Laparotomy.....	5—0.08%
White.....	4
Colored.....	1
Hysterorrhaphy.....	4
Pregnancy, abdominal.....	1

Craniotomy.....	2—0.03%	
White.....	0	
Colored.....	2	
Cephalopelvic disproportion.....	2	
Cleidotomy-right.....	1—0.01%	
Abortions.....		226
Spontaneous.....		216
In homes.....		100
Registered.....		47
Syphilis, maternal.....		17
Cause undetermined.....		29
Post-traumatic.....		1
Unregistered.....		53
Syphilis, maternal.....		15
Cause undetermined.....		38
In hospital.....		116
Cause undetermined.....		114
Hypertensive disease.....		1
Syphilis, maternal.....		1
Therapeutic.....		10
Hydramnios, acute, with twins.....		1
Hypertensive cardiovascular disease.....		5
Placenta, previa marginalis.....		1
Multiple sclerosis.....		1
Eclampsia antepartum.....		2
Other operations and procedures not including delivery.....		4198
Episiotomy.....		2521
Central.....		2437
Other.....		84
Perineorrhaphy.....		328
Indicated.....		267
Elective.....		61
Trachelorrhaphy.....		307
Indicated.....		55
Elective.....		252
Sterilization.....		96
Pomeroy.....		96
Hypertensive disease.....		13
Renal disease.....		4
Section, previous.....		20
Rheumatic cardiovascular disease.....		14
Tuberculosis, pulmonary.....		1
Multiparity.....		33
Varicose veins, severe.....		2
Deficiency, mental.....		1
Uterus, rupture of.....		4
Sclerosis, multiple.....		1
Cervix, amputation of.....		1
Cervix, carcinoma of.....		1
History, obstetric, poor.....		1

Amniorhexis for induction of labor.....	127
Convenience.....	7
Renal disease.....	1
Preeclampsia.....	41
Hypertensive disease.....	18
Placenta, premature separation of, low implanted.....	6
Vaginal bleeding, undetermined.....	40
Eclampsia.....	1
Hydramnios.....	2
Erythema multiforme.....	1
Pyelitis, antepartum.....	1
Placenta, previa partialis.....	1
Placenta, premature separation of, normally implanted.....	5
Vomiting of late pregnancy.....	1
Postmaturity.....	1
Rheumatic heart disease.....	1
Hysterostomy.....	28
Proctoperineorrhaphy.....	161
Head, manual rotation of.....	219
Head, forceps rotation of.....	163
Vaginal laceration, repair of.....	102
Phlebotomy.....	1
Placenta, manual removal of.....	15
Head, decapitated, manual removal of.....	1
Arm, prolapsed, replacement of.....	1
Willett clamp, application of.....	78
Decapitation.....	2
Craniotomy of decapitated head.....	1
Fillet, application of.....	3
Hemorrhoidectomy.....	1
Version, external.....	1
Salpingo-oophorectomy.....	2
Uterus, packing of.....	1
Colporrhaphy, anterior and posterior.....	2
Dilatation and curettage.....	19
Cyst, vaginal, excision of.....	3
Polyp, cervical, removal of.....	1
Clitoris, repair of.....	1
Laparotomy, exploratory.....	1
Hernia, umbilical, repair of.....	1
Sucundines, retained, manual removal of.....	3
Head, flexion of.....	1
Laceration, perirectal, repair of.....	1
Hysterectomy, supravaginal.....	1
Block, paravertebral.....	1
Bladder laceration, repair of.....	1
Appendicectomy.....	2
Hysterotomy-abdominal.....	1

Number of patients discharged from hospital.....	4316
From prenatal clinic.....	1581—36.63%

White.....	612	
Colored.....	969	
*From other sources.....		2735—63.36%
White.....	2668	
Colored.....	67	
Private patients.....		2462—57.04%
Unregistered clinic patients.....		273— 6.32%
White.....	206	
Colored.....	67	
Number of patients transferred.....		19
Medicine.....		11
Pneumonia.....	2	
Erythema multiforme.....	1	
Septicemia.....	3	
Tuberculosis.....	1	
Cardiac disease.....	1	
Endometritis.....	1	
Diabetes mellitus.....	1	
Embolus, cerebral.....	1	
Surgery.....		4
Obstruction, intestinal.....	1	
Appendicitis, acute.....	1	
Ascites.....	1	
Cyst, ovarian.....	1	
Gynecology.....		4
Abscess, pelvic.....	1	
Vulva, lipoma of.....	1	
Abortion, incomplete.....	1	
Endometritis.....	1	
Number of patients admitted.....		4254
Number of patients delivered for other services.....		5
Surgery.....	4	
Medicine.....	1	
Number of viable babies.....		6110
In homes.....		2281
White.....	189	
Colored.....	2092	
In hospital.....		3829
White.....	2899	
Colored.....	930	
Full term living.....		5696—93.22%
In homes.....		2153
White.....	180	
Colored.....	1973	
In hospital.....		3543
White.....	2741	
Colored.....	802	
Full term dead.....		113—1.85%
In homes.....		35
White.....	1	
Colored.....	34	



In hospital.....	78	
White.....	41	
Colored.....	37	
Premature living.....	248	4.06%
In homes.....	75	
White.....	7	
Colored.....	68	
In hospital.....	173	
White.....	102	
Colored.....	71	
Premature dead.....	53	0.87%
In homes.....	20	
White.....	1	
Colored.....	19	
In hospital.....	33	
White.....	17	
Colored.....	16	
Deaths in live born babies.....	118	1.98%
In homes.....	32	
White.....	2	
Colored.....	30	
In hospital.....	86	
White.....	61	
Colored.....	25	
Total fetal mortality.....	284	4.65%
In homes.....	87	
In hospital.....	197	
Total maternal mortality.....	11	0.175%
In homes.....	1	
White.....	0	
Colored.....	1	
Cardiac failure.....	1	
In hospital.....	10	
White.....	6	
Septicemia, puerperal.....	1	
Hemorrhage, cerebral.....	1	
Uterus, rupture of.....	1	
Adrenal gland, insufficiency of, acute.....	1	
Hemorrhage, postpartum.....	1	
Anesthetic, spinal.....	1	
Colored.....	4	
Tuberculosis, miliary.....	1	
Anesthesia, inhalation.....	1	
Cardiac failure.....	1	
Ileus, paralytic.....	1	
Deaths in registered clinic patients.....	8	0.217%
Deaths in unregistered clinic patients.....	2	0.379%
Deaths in private patients.....	1	0.041%

## SUMMARIES OF MATERNAL DEATHS

No. 47107: The patient was a 36 year old white woman, para 5-0-0-5, unregistered, admitted on November 18, 1941 because of vaginal bleeding. Her past history was

noncontributory. The prenatal course was uneventful until four weeks prior to admission, when there was slight spotting. The estimated date of confinement was December 31, 1941. She was considered to be thirty-two weeks pregnant on admission and bled profusely the day before being admitted. A sterile vaginal examination revealed the placenta covering one-third of the internal os and the fetus in a right sacro-anterior position. Amniorhexis was done and a fillet applied to the foot. The patient was delivered spontaneously of a thirty-four weeks dead male child weighing 4 pounds, 8½ ounces after eleven hours of labor. The third stage was uneventful and there were no lacerations. The postpartum course was normal until the sixth postpartum day, when her temperature rose to 101 F. For the next few days the patient ran a septic temperature which reached 104 F. on December 17, 1941. A blood culture proved positive for hemolytic streptococcus and sulfathiazole therapy was administered. Two negative blood cultures were then obtained. The temperature again became elevated and the blood cultures again proved positive. Sulfathiazole therapy was resumed and the patient was transferred to the medical service. Her condition was unchanged until early in January, after which she steadily became worse and died on January 17, 1942.

*Cause of death:* Puerperal endometritis with septicemia; bacterial endocarditis; cardiac decompensation.

A postmortem examination confirmed the clinical diagnoses.

*No. 50549:* The patient, a 42 year old white women, registered, para 4-0-0-4, was admitted to the hospital on March 25, 1942 because of hypertension. The past and family histories were noncontributory; her obstetric history was normal. The present pregnancy was uneventful until four or five weeks prior to admission, when she began to show symptoms of hypertension. Upon admission her pregnancy was of about thirty-seven weeks' duration and she presented a typical case of hypertensive cardiovascular disease, with acute cardiac decompensation. She responded fairly well to treatment, went into labor spontaneously, and after one hour delivered a full term dead male child on March 31, 1942. Her condition remained good until April 11, 1942, when she suffered a cerebral accident. She died on April 14, 1942.

*Cause of death:* Intracranial hemorrhage complicating hypertensive cardiovascular disease.

Permission for autopsy was not granted.

*No. 50986:* This patient was 24 years old, colored, para 4-0-0-3, and registered for home delivery. She was admitted to the hospital on April 12, 1942 because of severe vaginal bleeding. The past and family histories were noncontributory, and her past obstetric history was normal. Two hours prior to admission the patient experienced severe abdominal pain and began to bleed vaginally. When seen at home the uterus was found to be tetanically contracted and the patient was bleeding freely. Her blood pressure was 90 mm. of mercury systolic and 50 mm. diastolic. She was delivered of a full term dead male child by Porro section on April 12, 1942. The patient was in shock during the operation and her condition was critical at the completion of the operation. She received 1000 cc. of blood, 2000 cc. of plasma, 4350 cc. of intravenous fluid, and 50 cc. of adrenal cortex. Her blood pressure rose to 110 mm. of mercury systolic and 70 mm. diastolic. On the following day her condition was improved. Hemoglobin was 34% on April 14, 1942. The abdomen became distended and her course was rapidly downhill. She was given additional intravenous fluids and blood but despite treatment she died at 8:15 P.M. on the same day.

*Cause of death:* Paralytic ileus, secondary anemia.

Autopsy revealed considerable distention of the intestinal tract, a small amount of free fluid in the peritoneal cavity, and pallor of the viscera.

*No. 52114:* A private patient, 37 years old, white, para 0-0-1-0, was admitted to the hospital on May 27, 1942 because of ruptured membranes although not in labor. The family history was noncontributory. The patient had malaria three times and underwent two operations, an appendectomy and the removal of an ovarian cyst. Her past obstetric history showed that she delivered a twenty-seven weeks anencephalic monster in 1941. The present prenatal course was uneventful. The estimated date of confinement was May 25, 1942. On admission her blood pressure was 90 mm. of mercury systolic and 60 mm. diastolic. Medical induction on May 27, 1942 was unsuccessful. The patient went into labor spontaneously at 4:00 P. M. on May 29, 1942. She had good contractions with slow progress. At 10:00 P.M. she became pale and had a chill; the pulse rate was 140. She was given  $\frac{1}{2}$  gr. of morphine sulfate. Examination of the eyegrounds was negative. The axillary temperature was 101.8 F. Four drams of paraldehyde were administered, half of which she vomited. She was prepared for delivery at 11:15 P.M. under nitrous oxide and oxygen anesthesia. Urine obtained by catheter was bloody. She was delivered of a full term dead male child weighing 7 pounds, 13 ounces by low forceps and central episiotomy. The third stage was uneventful. A small laceration of the cervix and the episiotomy were repaired. About five minutes after the anesthesia was discontinued the patient became pale and somewhat cyanotic. She took a few sighing breaths and respiration ceased. All stimulants and artificial respiration were of no avail and the patient was pronounced dead at 12:35 A.M. on May 30, 1942. A postmortem exploration of the uterine cavity was negative. Wet and dry blood smears did not show malaria. Postmortem blood culture was negative.

*Cause of death:* Possible acute adrenal insufficiency.

Permission for autopsy was not granted.

*No. O.S.S.:* This patient, a 33 year old colored woman, registered, para 2-0-0-2, was first seen in the prenatal clinic when she was twenty-seven weeks pregnant. Her past history revealed that she had suffered from asthma for many years. Both previous pregnancies were normal, the last one being seventeen years ago. The physical examination was negative. The patient went into labor spontaneously on June 17, 1942 and was delivered of a full term living male child after fifteen hours of labor. Her postpartum course was uneventful until one week following delivery, when she developed symptoms of pyelitis. The next day she was dyspneic and there were numerous rales throughout both lung fields. Since she had been under the care of a private physician for these attacks he was called and treated her. She died the following day and the diagnosis of her physician was cardiac asthma.

*Cause of death:* Cardiac failure.

Permission for autopsy was not given.

*No. 53360:* The patient, a 27 year old colored woman, registered, para 1-0-0-1, was admitted to the hospital in labor on July 11, 1942. The family and past histories were noncontributory and her prenatal course was uneventful. The estimated date of confinement was August, 1942. Labor progressed normally without analgesia or anesthesia. The patient was delivered spontaneously of a premature living male child weighing 4 pounds, 14 $\frac{3}{4}$  ounces. Just prior to delivery her temperature rose to 102.6 F., for which no cause could be found. Her temperature returned to normal and on the third postpartum day it rose to 103 F. and for the first time there were symptoms in the chest which suggested pneumonia or miliary tuberculosis. Sulfa drugs were administered and the patient was placed in an oxygen tent. Four days after delivery the patient's husband gave a history of her having had tuberculosis, which information had been withheld purposely by the patient. Her course was steadily downhill and a roentgen ray examination on July 17 confirmed the diagnosis of miliary tuberculosis. The patient became worse and she died on July 25, 1942, fourteen days following delivery.

*Cause of death:* Miliary tuberculosis.

Permission for autopsy was not granted.

*No. 59258:* This patient, a 24 year old white woman, unregistered, para 0-0-0-0, was admitted to the hospital on February 6, 1943, having been referred by her private physician because of a breech presentation and prolonged labor. The past and family histories were noncontributory. Labor began at term and the patient was admitted to a private hospital, where after approximately forty-eight hours of labor she was given ether anesthesia and delivery was attempted. This was unsuccessful and the patient was admitted to the University Hospital on February 6, 1943 at noon. On admission her temperature was 98.6, the pulse rate was 164, respirations were 24 per minute, and the blood pressure was 120 mm. of mercury systolic and 80 mm. diastolic. The patient appeared dehydrated and mildly shocked. Examination revealed a breech presentation and the fetal heart could not be heard. On rectal examination it was noted that there was tremendous edema of the genitalia. Cervical dilation could not be determined definitely at this time. However, it was thought that the cervix was fully dilated and that the breech was at the level of the spine. The patient was given mild sedation and intravenous fluids. The pulse rate improved somewhat and the patient continued to bear down strenuously. Three hours after admission the presenting part was on the perineum and the patient was prepared for delivery after being typed and cross matched for a blood transfusion. Because of her poor condition 500 cc. of plasma was started at this time. It was found that there was a laceration of the left labium and a deep tear of the vagina anteriorly and to the right, extending into the vaginal vault. The presentation was a frank breech which could not be extracted as such. Upon introducing the hand to bring down a foot, a rent in the uterus on the right was discovered. Decomposition of the breech was accomplished without much difficulty and the body of the baby was extracted with ease. However, the head did not enter the pelvis, an apparent and definite inlet contraction being present. A craniotomy was therefore done and the head extracted with axis traction forceps. A full term dead male child weighing 7 pounds, 2 ounces was delivered at 5:00 P.M. on February 6, 1943. The placenta followed almost immediately but the uterus remain relaxed. The patient's condition had become desperate during the delivery and after expression of the placenta a transfusion of whole blood was started. Before she could receive more than a few cc. her respirations ceased and she was pronounced dead at 5:20 P.M.

A postmortem exploration of the genital tract revealed an extensive laceration of the vagina and the cervix, which was continuous with the previously mentioned vaginal laceration. This laceration extended well into the lower uterine segment, and a transverse tear of the uterus measuring 8 to 10 cm. in length was palpable in the lower uterine segment. There was a small number of dark blood clots in the peritoneal cavity. The diagonal conjugate was measured and found to be 9 cm.

*Cause of death:* Ruptured uterus.

Permission for autopsy not granted.

*No. 59614:* The patient, 22 years old, white, registered, para 1-0-0-1, was admitted to the hospital on February 17, 1943 in active labor at term. The previous pregnancy and labor were uncomplicated. The patient had previously been admitted to the hospital on February 2, 1943 for hypertension and was discharged as improved on February 10, 1943. On February 17 her blood pressure was 170 mm. of mercury systolic and 110 mm. diastolic. Labor proceeded normally under nembutal and paraldehyde analgesia, and the patient delivered spontaneously at 6:30 A.M. on February 19, 1943 a full term living female child weighing 7 pounds, 2½ ounces. The third stage, which lasted eight minutes, was accompanied by profuse bleeding. The placenta and membranes were expressed, apparently intact, followed by some clots. The pulse rate at this time was 124, respirations were 22,



and the blood pressure was 120 mm. of mercury systolic and 80 mm. diastolic. Morphine and 25% glucose were administered. At 7:45 A.M. the pulse could not be felt and the blood pressure was zero. There was a considerable amount of blood in the patient's bed and she appeared moribund. She was given 500 cc. of plasma immediately and this was repeated in half an hour. At 9:15 A.M. 300 cc. of blood was given. Intravenous pitocin and ergotrate were also administered. The patient continued to bleed and she was made ready for sterile pelvic examination, at which time the uterus and vagina were packed. She showed only a slight improvement and her condition remained desperate. No type B blood was available, therefore hemoglobin solution was given. The patient rapidly recovered from shock following this therapy and her blood pressure rose to 130 mm. of mercury systolic and 75 mm. diastolic. At 2:00 P.M. her blood pressure was 150 mm. of mercury systolic and 110 mm. diastolic, and the pulse rate 115. At this time she was again prepared for a sterile pelvic examination and a small piece of placenta, about 5 cm. in diameter, was removed and bleeding stopped immediately. The patient suffered an attack of pulmonary edema on February 21, 1943 which responded to therapy. Her urinary output was poor throughout and was improved only slightly by a paravertebral block on the sixth postpartum day. Starting on the second postpartum day she was given digitalis but this was now discontinued because of the poor urinary output. The patient received repeated blood transfusions and supportive therapy. In the morning of February 27, 1943 her pulse suddenly fell from 74 to 40. At 6:00 A.M. she became dyspneic and died at 9:10 A.M.

*Cause of death:* Retained placenta with postpartum hemorrhage and shock.

Additional diagnoses: Preeclampsia, uremia, renal shutdown, heart block, and pulmonary edema.

*Autopsy findings:* Petechial hemorrhage-kidneys; acute cardiac dilatation; moderate cardiac hypertrophy; distention of visceral veins; pallor of viscera; congestion of liver, lungs, and kidneys; edema of brain; acute necrosis anterior hypophysis.

*No. 62221:* This patient, 23 years old, colored, registered, para 0-0-1-0, was admitted to the hospital on May 22, 1943 at term and in active labor. The past and family histories were noncontributory. Her prenatal course was essentially negative. Labor started at 3:00 P.M. on May 21, 1943 and the membranes ruptured at 2:00 A.M. on May 22, 1943. The progress of labor was normal under nembutal and paraldehyde analgesia, and at 5:43 A.M. she was delivered of a full term living female child by low forceps and central episiotomy under gas-oxygen-ether anesthesia. The third stage was normal and lasted four minutes. Total labor was fourteen hours and forty-seven minutes. The cervix was examined and no lacerations were found. As the repair of the episiotomy was started it was noted that the patient was pulseless and respirations ceased suddenly at 6:04 A.M. Artificial respiration and stimulants were injected intravenously and intracardially. All attempts at resuscitation were of no avail and the patient was pronounced dead.

*Cause of death:* Anesthesia-peripheral vascular collapse.

*Autopsy findings* were confirmatory.

*No. 63192:* This patient was 36 years old, white, registered, para 7-0-0-7. She was admitted to the hospital on June 26, 1943 because of pyelitis and pregnancy of thirty-six weeks' duration. She had a large ventral hernia which had been repaired one year ago and which apparently resulted from the repair of an umbilical hernia five years previous. The hernia had recurred early in the present pregnancy but had given no pain or difficulty. About twelve hours after admission the patient began to vomit and to have symptoms of intestinal obstruction. This condition was not relieved by ordinary means and on the evening of June 27, 1943 immediate relief became necessary. It was felt that the uterus should be emptied and the hernia not interfered with, and because of the time element

termination by the abdominal route was chosen. Her general condition was such that it was thought a general anesthetic was contraindicated, therefore spinal anesthesia was given. Five minutes after the injection the patient became pulseless and her blood pressure dropped to zero. Within a few minutes she was dead. Five minutes following death a postmortem cesarean section was done and a full term living female child weighing 6 pounds, 6 ounces was delivered.

*Cause of death:* Spinal anesthesia.

Permission for autopsy was not granted.

*No. 67985:* The patient, a 30 year old colored woman, para 5-1-1-4, registered, was admitted to the hospital on December 10, 1943 because of an infection of the upper part of the respiratory tract and possible early cardiac decompensation. The family and past histories were noncontributory, except for positive serologic tests for syphilis. The estimated date of confinement was January 18, 1944. On admission the patient's temperature was 100.2 F., pulse rate was 98, the rate of respiration was 34, and the blood pressure was 130 mm. of mercury systolic and 70 mm. diastolic. She complained of pain in the chest and shortness of breath. After a medical consultation her condition was diagnosed as an infection of the upper part of the respiratory tract, luetic cardiovascular disease with mitral and aortic lesions, and grade 2 cardiac failure. The patient was given digitalis and treated conservatively. A roentgen ray examination of the chest was negative. On December 11, 1943 labor began spontaneously and after four and one-half hours the patient delivered, without anesthesia, by breech extraction, a full term living female child weighing 5 pounds, 15½ ounces. The third stage was uneventful and postpartum bleeding was slight. The patient was delivered at 4:20 A.M. and at 5:00 A.M. she was found to be definitely dyspneic, with a rapid weak pulse; the blood pressure was unobtainable. She was seen by a medical consultant and stimulated vigorously in every known manner. At 6:25 A.M. she was pronounced dead.

*Cause of death:* Cardiac failure.

Autopsy was not performed.

Number of serologic tests for syphilis in clinic patients.....	3674
White.....	763
Colored.....	2911
Number of positive results in clinic patients.....	462—12.59%
White.....	18
Colored.....	444
Number of positive results treated in clinic patients.....	405
White.....	11
Colored.....	394
Full term alive.....	349
Full term dead.....	20
38 weeks alive.....	1
36 weeks alive.....	7
34 weeks alive.....	3
34 weeks dead.....	1
32 weeks alive.....	2
32 weeks dead.....	2
28 weeks alive.....	1
26 weeks abortion.....	11
20 weeks abortion.....	6
12 weeks abortion.....	2
Number of positive results in clinic patients not treated.....	57
White.....	2
Colored.....	55

Full term alive.....	44
Full term dead.....	1
36 weeks alive.....	6
36 weeks dead.....	2
27 weeks abortion.....	3
12 weeks abortion.....	1
Number of clinic patients without serologic tests for syphilis.....	0

## MATERNAL MORTALITY COVERING SIX YEAR PERIOD

	1938	1939	1940	1941	1942	1943
Pregnancy, abdominal.....	1					
Abruptio placenta.....	2	1	1			
Shock, intrapartum (without hemorrhage)...	1					
Embolus, pulmonary.....	1					
Infection, puerperal.....	1		2	1	1	
Uremia.....	1					
Reaction, transfusion.....	1					
Anesthetic.....	1	1	2			2
Heart disease, rheumatic-decompensation...	1		1			
Liver, acute yellow atrophy of.....		1				
Cardiovascular collapse.....		1	1	1	1	1
Cardiac dilatation.....		1	1		1	
Uterus, rupture of.....		1	1	1		1
Hemorrhage, intracranial.....			1	2		
Arsphenamine encephalitis.....				1		
Tuberculosis pulmonary.....				1	1	
Embolus, cerebral.....				1		
Leukemia, acute myeloid.....				1		
Eclampsia, ante and intrapartum.....				1		
Hemorrhage, postpartum.....						1
Ileus, paralytic.....					1	
Adrenal gland, insufficiency of.....					1	
Total.....47	10	6	10	10	6	5

Rate per 1000 live births 1942—2.05.

Rate per 1000 live births 1943—1.65.

PROCEEDINGS  
of the  
University of Maryland Biological Society

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Robert H. Oster  
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ONE HUNDRED AND THIRTY-THIRD PROGRAM MEETING

The One Hundred and Thirty-Third Program Meeting was held on Wednesday, March 15, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

The following program was presented:

"Studies on the Locomotion of Salamanders," by Dr. F. Gaynor Evans, Department of Gross Anatomy, School of Medicine, University of Maryland.

"Poliomyelitis Induced by Inoculation of Tooth Pulp Cavities," by Drs. Myron S. Aisenberg and Thomas C. Grubb, School of Dentistry, University of Maryland.

Abstracts of these papers follow.

STUDIES ON THE LOCOMOTION OF SALAMANDERS

F. GAYNOR EVANS, PH.D.\*

The forelegs play an active role in the locomotion of salamanders and not a passive one of mere support as frequently supposed. The humerus is a propulsive lever working in a horizontal plane, whereas the forearm is a supporting column transmitting the propulsive force to the substratum. The hand has no active part in propulsion and represents the expanded base of the weight supporting column, the forearm. The digits, especially the inner two, support the body weight, the palm of the hand not touching the substratum except during rest, and are kept pressed against the ground by the flexor muscles, thus pre-

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\* From the Department of Gross Anatomy, School of Medicine, University of Maryland.



venting backward slipping. The entire hand is supple and at the beginning of the recovery phase is strongly flexed. Toward the end of the phase it is extended just before being placed on the ground again.

Slow motion moving pictures of *Triturus granulosus* and tracks of *Amblystoma opacum* made on smoked paper show that the body is raised completely from the ground during ordinary locomotion and that the chief functional joints of the hand are the proximal transverse carpal and metacarpophalangeal joints.

The axial muscles aid in ordinary slow locomotion by producing lateral undulations of the trunk. Rapid locomotion is accomplished entirely by the axial muscles, the legs taking no part in it.

## POLIOMYELITIS INDUCED BY INOCULATION OF TOOTH PULP CAVITIES

MYRON S. AISENBERG, D.D.S.\* AND THOMAS C. GRUBB, Ph.D.†

Since there is still considerable uncertainty regarding the path by which the poliomyelitis virus reaches the central nervous system, it appears of interest to determine whether other routes besides the respiratory and alimentary tracts may serve as the entry portals. The recent report by Faber and Silverberg (1942) of the presence of the virus in the semilunar (Gasserian) ganglion suggested that the virus might enter the pulp chamber of a carious tooth with pulpal exposure and travel via the maxillary and mandibular divisions of the fifth nerve to the semilunar ganglion and thence to the central nervous system.

To test this hypothesis, the pulp chambers of the anterior teeth of three *Macacus rhesus* monkeys under nembutal anesthesia were exposed. The pulps were removed and a drop of 20 or 40 per cent suspension of the Creach strain of the virus was placed in each canal and the cavities sealed with Plicene (Central Scientific Co.) in the successful experiment and silver amalgam in the unsuccessful experiments. Two of the three animals inoculated with the use of silver the first or second time failed to develop paralysis during an observation period of sixteen to fifty days. The negative results may have been caused by the oligodynamic action of the silver fillings and the use of only a 20 per cent suspension of virus. The third animal was inoculated in a similar manner with 20 per cent virus and the cavities sealed with Plicene. When paralysis did not develop after a three week observation period the animal was again inoculated with a 40 per cent suspension of virus and the cavities sealed with Plicene. Seven days later this animal showed tremors of the hind legs and all four legs were paralyzed on the following day. On the ninth day the monkey was sacrificed and histologic sections of the cord showed the characteristic pathology of poliomyelitis. The Gasserian ganglia showed definite cellular infiltration, some neuronophagia, and karyolysis of many of the ganglion cells.

It was considered desirable to publish this preliminary report since there is no evidence in the literature of poliomyelitis having been previously produced experimentally by inoculation of pulp canals. It is by no means implied that this experiment proves that poliomyelitis may be acquired under natural conditions in human beings by infection through carious teeth. However, it is believed that these results do indicate a possible pathway of the virus which has not been hitherto considered.

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\* From the Department of Oral Surgery, School of Dentistry, University of Maryland.

† From the Department of Bacteriology, School of Dentistry, University of Maryland.

## ONE HUNDRED AND THIRTY-FOURTH PROGRAM MEETING

The One Hundred and Thirty-Fourth Program Meeting was held on Wednesday, April 19th, at 4:00 P.M. in the Bressler Lecture Hall.

The program consisted of the following papers:

"Recovery of the Cerebral Cortex of the Cat Following Hypoxia," by Drs. Robert H. Oster, J. E. P. Toman, and Dietrich C. Smith, Department of Physiology, School of Medicine, University of Maryland.

"Experimental Diabetes Produced by Alloxan," by Dr. Walter L. Hard, Department of Histology, and Dr. C. Jelleff Carr, Department of Pharmacology, School of Medicine, University of Maryland.

Abstracts follow.

### RECOVERY OF THE CEREBRAL CORTEX OF THE CAT FOLLOWING HYPOXIA

ROBERT H. OSTER, PH.D., J. E. P. TOMAN, PH.D., AND DIETRICH C. SMITH, PH.D.\*

Healthy mature cats were exposed in an observation chamber to nitrogen-air mixtures. When artificial respiration was begun at the point of respiratory failure (survival end point) only six deaths resulted from 300 hypoxia tests on seventy animals. The corrected mean survival time varied from 2.2 minutes at zero concentration to 40 minutes at 4.2 per cent oxygen. At 4.5 to 5.0 per cent oxygen the survival time rose to above two hours. When the animals were exposed daily to the low oxygen concentration adaptation of as high as 80 per cent, an increase in survival time occurred. With weekly exposures adaptation did not occur. During recovery extensor responses preceded flexor in the same limb and lower nervous centers recovered before higher ones. In general, recovery of reflexes proceeded from the head caudad. If animals had been promptly resuscitated, vision and the hopping and placing reactions returned within ten minutes. In the following hour residual ataxia disappeared and normal activity returned in two hours. Permanent central nervous damage occurred in five animals after from twelve to twenty-one daily hypoxia trials at 3.5 per cent oxygen. These cats showed lasting impairment characterized by blindness, deafness, anorexia, loss of hopping and placing reactions, and general depression of activity. In these animals and others in which artificial respiration was purposely withheld for from 30 to 145 seconds, cardiac recovery was slow following the last exposure. Two were maintained for several months and recovered from the major disabilities but developed permanent hyperactivity and a stereotyped cage-scratching behavior. Brain sections of these animals showed scattered cell damage from the cerebral cortex to the medulla, including definite chromatolysis in all neocortical layers, particularly in the outer pyramids, and most definite in the primary visual cortex. Damage was also marked in the lateral geniculate and moderate in the superior and inferior colliculi, thalamic midline nuclei, medullary reticular formation, and the nucleus gracilis. Electrocorticograms of the impaired animals showed continuous 3 cycles per second dysrhythmia compared with 6 to 10 cycles per second in normal cats. Under the test conditions used the margin of safety between the time of appearance of central nervous damage and irreversible circulatory failure is apparently narrow.

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\*From the Department of Physiology, School of Medicine, University of Maryland.

## EXPERIMENTAL DIABETES PRODUCED BY ALLOXAN\*

WALTER L. HARD, PH.D.† AND C. JELLEFF CARR, PH.D.‡

The use of alloxan, a ureide of uric acid, was reported in 1943 by a British group to produce a selective necrosis of islet tissue. The obvious value of an experimental diabetic animal for a study of diabetes mellitus and an inquiry into the mechanism of action of alloxan led to the following study.

Rabbits were the animal of choice and a total of twenty-five were subjected to doses ranging from 10 to 300 mg./kg. An optimum dose of 100 mg./kg. proved most satisfactory in the production of a diabetic condition without resulting in kidney damage, which may occur with larger doses.

The initial effect of the alloxan results in a hyperglycemia (185 to 400 mg./100cc.) within a period of two to five hours following injection. Blood pressure recordings on dogs and the presence of necrotic areas in the adrenal medulla of the experimental animals suggest that this initial hyperglycemia may be the result of adrenal stimulation. A hypoglycemia develops within twenty-four hours following injection and this may be sufficiently severe to result in convulsions, particularly with higher doses. This condition is followed by a secondary hyperglycemia (247 to 396 mg./100cc.) which persists indefinitely.

A study of islet tissue, differentially stained for the alpha and beta cells, shows the immediate effect of alloxan to result in degranulation of the beta cells. This release of insulin is responsible for the hypoglycemia. Hydropic degeneration of the beta cells may occur, but with lower doses a persistent degranulated condition of the beta cells results. The alpha cells appear unaffected by the alloxan. Glycogen and fat concentrations in the livers of the experimental animals are within limits of normal control animals, thus suggesting that the liver is not disturbed in the metabolism of these constituents. However, further work is necessary to determine how this experimental diabetic condition compares with that which occurs spontaneously.

## ONE HUNDRED AND THIRTY-FIFTH PROGRAM MEETING

The One Hundred and Thirty-Fifth Program Meeting was held on Wednesday, May 17, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

A paper on "Some Quantitative Effects of X-Rays on Several Naturally Occurring Compounds" was read by Dr. Rubert S. Anderson of the Department of Physiology, School of Medicine, University of Maryland.

\* The expense of this investigation has been defrayed in part by a grant from the Bressler Research Alumni Fund of the School of Medicine, University of Maryland.

† From the Department of Histology, School of Medicine, University of Maryland.

‡ From the Department of Pharmacology, School of Medicine, University of Maryland.

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The names listed above are officers for the term beginning July 1, 1943 and ending June 30, 1945

## NEWS FROM THOSE IN THE ARMED FORCES

The following are abstracts from the diary of Capt. Timothy A. Callahan, Class of 1938, who recently was promoted to his present rank.

September 8, 1943

It is early in the morning and I have just finished a proper Chinese breakfast. It began with watermelon seeds, then a glass of green tea with no cream or sugar. The first course was sour dumplings which are dipped into a meatish-tasting soup, then a great bowl of chow mein, shreds of chicken, ham, dried mushrooms, noodles, and other strange and mysterious ingredients. Another large bowl of clear soup followed to wash away the greasy feeling in one's mouth. Finally, the piece de resistance—a stew with noodles of fresh eels. I fell short on this and left the place bursting. Of our party all are old hands at living here. I am a great embarrassment to them when I furtively try to conceal my chopsticks and take my victuals with the only instrument on the table I can use—a community soup spoon. I stay amazingly well in spite of all this.

The countryside has been delightful. I like it far better than any of the East I have seen. The villages, though lacking some Western amenities, are quite charming. The rocking chair legged roofs, the innumerable courtyards within courtyards, and the ready smile of the people make one feel quite at home.

Another very charming custom is that when an American soldier goes through a group of small children a loud shout of "Ding-How" comes up. Ding means "of the most superlative" and How "the most ulterior best."



I find that this is universal in China and is purely bad American Chinese. The people down to the smallest children have taken it up as a serious sort of joke. I wish I could write where I am and what I am doing, but the war precludes it.

October 11, 1943

This job has been a magnificent break and means more to me than anything so far in the last two years; it is a unique experience. I cannot write you anything really about it, except to say I am with congenial companions and we think we are getting a good job done. . . .

We have had no news of the war since August and right now you know much more than we. What a remarkable war this is. A very considerable part of our travel has been by horseback and ten hours a day in the saddle is not unusual. Much of the way has been over trails much worse than along the paths in our own woods, over mountain passes and through magnificent valleys which pale even the National Geographic into mediocrity.

It's strange now how I look back upon my last station as really a proper center of civilized life! It boils down to what one takes as a point of view, I guess.

October 22, 1943

I am writing this note during another halt. It is late morning and after a torrential rain the sun is shining and the country just steaming; we are now well on our way home, everybody very cheerful and even the weather does not bother us.

It has been since early September that I have tasted a bit of fresh meat. Most of our supplies have run out and we have had rice three times a day, day in and out. Above all when we get back I believe the thing we look forward to most is a meal of U. S. A. or English food.

In addition to my regular practice this jaunt has seen me in another role—my veterinary patients have been almost as numerous as my two-legged ones. A hollow cough coming from the stable gives me as much anxiety as one of the party reporting sick with chills and fever.

It will be strange to get back to beds and sheets and bathrooms—stranger still, to hospital practice with everything “laid on” as the Army says, but it will look mighty good.

October 25, 1943

Today's journey was almost like traveling through a flower garden; magnificent orchids blooming everywhere in profusion, purples, magenta, yellow, white, scarlet, blue—it is unbelievable, most of them springing from some dead tree lining the trails. As you know, they are a parasitic plant like the mistletoe. The yellow ones with a purplish-brown centerpiece were splen-

didly fragrant as well, a cross between lilies of the valley and a calla lily. I decked my horse's bridle with about \$75 worth to my immense amusement and satisfaction. There are many other wild flowers all about as well as orchids, a pinkish plant with a luxuriant bloom like the dogwood flower only much more profuse and very sweetly scented; gigantic morning glories or some kind of trumpet flower in all colors and innumerable smaller flowers, most of which I do not recognize.

TIMOTHY A. CALLAHAN

## CITATIONS

### THE LEGION OF MERIT

First Lieutenant Timothy A. Callahan, Medical Corps, Army of the United States. For exceptionally meritorious conduct in the performance of outstanding services. In September, 1943, Lieutenant Callahan volunteered to accompany a small reconnaissance party through dense jungles and precipitous mountain passes from . . . China to . . . Burma. It is believed that many of the hundreds of miles covered by this reconnaissance party on foot and horseback had never before been traveled by white men. In spite of the difficulties of strange languages and total absence of medical information in the places visited, Lieutenant Callahan's systematic and comprehensive report of the prevalence of disease in each area contributed greatly to future operations in this territory.

Entered the military service from Maryland.

By command of Lieutenant General Stilwell:

### THE LEGION OF MERIT

Albert A. Kurland, 0-418226, First Lieutenant, M.C., . . . Infantry Regiment, for exceptionally meritorious conduct in the performance of outstanding services. In the face of incessant German artillery and mortar fire, Lieutenant Kurland administered medical treatment to the wounded during an attack on German positions. By his brilliant work and efficiency during a period when the . . . Battalion Aid Station was subjected to heavy German cannon and mortar bombardment, he saved the lives of many critically wounded men. Lieutenant Kurland has been exceptional in that no risk of his own life was too great when he saw that treatment should be administered to a sick or wounded soldier. His loyalty and devotion are a credit to the medical profession.

Entered service from Baltimore, Maryland.

By command of General Eisenhower:

## SOLDIER'S MEDAL

Capt. Mason Trupp, Class of 1937, has been awarded the Soldier's Medal. The official citation read as follows:

Captain Trupp, on duty as flight surgeon, awaited the takeoff of heavy bombers on a combat mission. One of the planes attempting to take off crashed and burst into flames. Reaching the wreckage with the least possible delay, he disregarded the fact that the burning plane was loaded with ammunition, fuel and bombs, and though repeatedly knocked down by concussions from exploding bombs and fuel tanks, went forward to render first aid to the only surviving member of the crew and removed him to an ambulance.

The next plane, taking off in the opposite direction, crashed and burst into flames. Again Captain Trupp disregarded his personal safety and attempted to rescue members of the crew. Again he was knocked down by the concussion of exploding bombs and fuel tanks, as well as endangered by exploding ammunition.

Captain Trupp executed his duty in an exceptional and heroic manner worthy of the best tradition of the military service.

Captain Trupp is now serving with the Army Medical Corps in India.

Capt. H. L. Rigdon, Class of 1937, has recently returned to the 142nd General Hospital and was cited for the work of his surgical combat team.

## PROMOTIONS

Col. Murray M. Copeland, commanding officer of the 142nd General Hospital in the Fiji Islands since June, 1943, recently was promoted from the rank of lieutenant colonel.

Colonel Copeland also has received a commendation for his own and his unit's service from the commanding general of Army service forces in this theater. It reads in part:

Colonel Copeland assumed command of the 142nd General Hospital, which unit has performed an exacting duty in a conspicuous manner. The conscientious endeavors by this officer have been an inspiration to his staff and personnel.

The versatility this officer possesses, the ability to rise above a situation and to take it in hand, and the skill he possesses as an organizer resulted in the establishment of a hospital in the field comparable to any of its kind in the world."

Recent promotions at the 142nd General Hospital:

*To rank of Lieutenant Colonel:*

Walter L. Kilby, chief of radiologic service. Colonel Kilby was Acting Professor of Roentgenology when called to active duty.

*To rank of Major:*

John L. Atkins, ward officer and chief cardiologist. Major Atkins formerly was an Assistant in Medicine at the School of Medicine, University of Maryland.

George G. Brouillet, Class of 1935, ward officer and chief of general surgery. Before going on active duty Major Brouillet was an Assistant in Surgery here.

William W. McKinney, ward officer and in charge of septic surgery. Major McKinney formerly was an Assistant in Surgery.

Lauriston L. Keown, Class of 1933, ward officer and chief of the communicable and infectious disease section. Major Keown was an Assistant in Pediatrics before going on active duty.

Marion H. Gillis, Jr., Class of 1936, chief of the eye, ear, nose, and throat section. Major Gillis was an Assistant in Ophthalmology when called to active duty.

Other promotions include:

*To rank of Commander:*

Frank K. Morris, Class of 1927. Commander Morris is now serving at the U. S. Naval Hospital, Philadelphia, Pa.

*To rank of Major:*

Mortimer D. Abrashkin, Class of 1932. Major Abrashkin is serving with the 7th Station Hospital, A.P.O. 207,  $\frac{c}{o}$  Postmaster, San Francisco, Calif. He writes of a recent visit from Lieut. Col. Harry C. Hull, a classmate.

*To rank of Captain:*

Harry McBrine Beck, Class of 1939.

Julius C. Brooks, Class of 1941, was recently promoted to his present rank and is now stationed at Fort Jackson, S. C. with Co. C of the 59th Medical Battalion. Captain Brooks has just returned after serving thirteen months in the Aleutian Islands.

Robert A. Kiefer, Class of 1942.

Albert A. Kurland, Class of 1940.

Sidney Scherlis, Class of 1938.

The following members of the Class of 1914 are serving in various branches of military service:



Capt. John R. Agnew, M.C., U.S.N.R., is Navy Inspector of Recruiting and Induction in the First Joint Service Induction Area, Boston, Mass.

Col. Everett L. Cook, M.C., A.U.S., is in command of the Newton D. Baker General Hospital, Martinsburg, W.Va., which was dedicated on June 9, 1944.

Lieut. Col. Chauncey E. Dovell, M.C., A.U.S., is located at 663 Prospect Avenue, Hot Springs, Ark.

Lieut. Col. Alfred Mordecai, M.C., A.U.S., is on the medical staff of the Walter Reed General Hospital, Washington, D. C.

Lieut. Col. Frank W. Wilson is serving with the Army Medical Corps but his present address is unknown.

Lieut. Col. Harry S. Shelley, Associate in Genito-Urinary Surgery, is chief of the surgical section of an evacuation hospital in England. He has had the unusual opportunity of attending some of the British civilian hospitals where he observed the work done in his own specialty, urology. He is most enthusiastic about his work and sends greetings to his friends here. Col. Shelley's address is 101st Evacuation Hospital, A.P.O. 403, c/o Postmaster, New York, N. Y.

Lieut. Col. Harry C. Hull and Major D. J. Greiner of the 142nd General Hospital are doing important work at the front lines in wounds and ballistics, that is, a study of the types of wounds and the causative factors. This necessitates working close to the combat areas in which these casualties occur.

#### V-MAIL LETTER TO ALUMNI ASSOCIATION

4 May, 1944

Dear Folks:

Do you realize that one of us is the medical officer on the famous USS *Sullivans*—yep, that's what I have been doing these past eight months. It's a soft job, so soft it's almost a crime to take the money.

There are 19 *Sullivans* aboard, including an uncle of the boys. We had the movie "The *Sullivans*" aboard last month. The Uncle, Pat S., about 40 years old, said it was quite true to life.

I met Dr. Herman Chor, Class of 1928, I believe, who is a commander and the chief psychiatrist in a Navy base hospital in Pearl Harbor.

Regards,

MORTON E. BASSAN,

Lieut. (j.g.) M.C., U.S.N.R. (Class of 1942)

The following interesting letter is from Lieut. Morton L. Hamburger, Class of 1942. His address is 149th Station Hospital, A.P.O. 713, Unit #2, % Postmaster, San Francisco, Calif.

March 8, 1944

Tonight we have the extraordinary privilege of a movie and it's my night off and I won't miss it.

My day today was not unusual but every day I get to realize more and more what a good bunch of boys we brought with us. They are all kids, 19 to 22, and they are not used to seeing men cut or broken, and when they come in the looks in the kids' eyes are full of wonder and pain and tenderness for the fellow that is hurt. They handle the boys ever so gently. It is strange, but I feel so much older than these fellows and they are so dependent on us. You can see their relief when we come to look at the men on the stretchers. They are so sure we will know what to do that it even frightens me a little, because sometimes I am not so sure myself. These kids will go back men.

The natives are a peculiar bunch, generally very short and slight but wiry as nails. They have a head of hair that is unbelievable, it is so heavy. It sets out about four inches of kinky black or dark brown hair in every direction. Under that great mop of hair is an immobile face, with eyes that are curious and follow every move you make. As they stand a little away in their loin cloths and holding the constantly present two foot long bolo knife you can hardly tell whether to be afraid or not. Actually, they are like well behaved children. They are timid and approach the white man hesitantly and with great awe. When they get friendly they are a lot of fun. They say "yes" to nearly everything, grin and show their black teeth, and look like they wish they were some place else. You can feel sorry for these little people, they are so patient and long-suffering, so grateful for attention and so afraid to look for it that it is pitiful.

The other morning I woke up to find six or seven natives huddled around a fire, covered with their frayed rags and shivering. When you ask them what they want they say, "I'm sick." They may have been sitting there all night long with their malaria, for all I know. They love to have a bandage and are proud as punch if they get one. They would sell their skin (which is not very good) for a bottle of peroxide to make their hair red. One came in with a terrible burn from his shoulder blade to his heels, blistered from one end to the other. He had done it the night before and had probably gone in and out of shock during the night. He should have been dead but he only had a temperature of 103. He waited till I woke up to come. They won't touch a thing without asking, won't even take water.

There was a new outfit that came in several days ago and turned up some very strange things that might amuse you—and one man turned up. The place they selected for their camp site turned out to be an old native burial ground. It seems that they bury a little shallow here and the boys turned up some remnants when clearing the ground. Funny thing,—the very young are buried standing up, and the adults or members of a family are put together in such a fashion that the feet are together at a central point and the bodies stretch out north, east, south, and west. The more important people are left standing more shallow. A little trench is cut out, the recipient inserted, and bamboo and twigs arranged on top, and finally a sprinkling of earth. They do not throw earth on the bodies. Some business.

Sincerely,  
MORTON L. HAMBURGER

### ITEMS

Dr. John C. Krantz, Jr., Professor of Pharmacology, School of Medicine, University of Maryland, has been appointed consulting pharmacologist and toxicologist to the Army Service Forces.

On April 17, 1944 Dr. Krantz delivered the Horace Wells Centenary Lecture in Detroit under the auspices of the Michigan State Dental Society. The subject of the address was "Anesthesia, Man's Redemption from Pain."

Dr. Frederick K. Bell was appointed U. S. Pharmacopoeia Fellow in the Department of Pharmacology, School of Medicine, University of Maryland for another year. The problem of his research is a chemical assay of digitalis.

Dr. William E. Evans, Jr., Assistant Professor of Pharmacology for some time in the Department of Pharmacology, was advanced to Associate Professor of Pharmacology on April 1, 1944.

### CANCER RESEARCH ROUND TABLE MEETS IN THE DEPARTMENT OF PHARMACOLOGY, SCHOOL OF MEDICINE, UNIVERSITY OF MARYLAND

Distinguished scientists interested in cancer research in many institutions met in the Department of Pharmacology on May 24, 1944. The following program was presented, with Dr. John C. Krantz, Jr. as presiding officer.

- 10:30 A.M. Dr. Frank H. J. Figge, Associate Professor of Anatomy. A. "Porphyrin Metabolism and Cancer Susceptibility in Experimental Animals."
- 11:00 A.M. Dr. Frank H. J. Figge. B. "Red Fluorescent Sebaceous Secretions in the Human Subject and Sunlight Cancer."
- 11:30 A.M. Dr. Edward G. Jones, Resident in Gynecology. "Red Fluorescence of the Genitalia in Women." (Jones, Figge, and Hundley.)
- 12:00 noon Dr. Frank H. J. Figge. "The Identity of the Porphyrins Associated with Cancer Susceptible Organs and Tissues."
- 12:30 P.M. Discussion.
- 1:00 P.M. Luncheon in the University Hospital dining room as guests of the faculty of the University of Maryland.  
Dr. Thomas S. Cullen, Professor Emeritus of Gynecology, Johns Hopkins Medical School. "Howard A. Kelly and the Early Days of Radium in Baltimore."
- 2:30 P.M. Dr. J. Mason Hundley, Jr., Professor of Gynecology. "Discussion of Several Interesting Ovarian Tumors."
- 3:30 P.M. Dr. Grant E. Ward, Associate Professor of Surgery. "Adamantinomas of the Jaw."
- 4:00 P.M. Dr. John E. Wirth, Director of Tumor Clinic, U. S. Marine Hospital. Demonstration of Radium Emanation Plant with Automatic Controls.



## OBITUARIES

### ERNEST SOUTHERLAND BULLUCK, M.D.

Dr. Ernest Southerland Bulluck, a prominent surgeon in Wilmington, N. C., died suddenly on March 17, 1944.

Dr. Bulluck was born in Whitakers, N. C. on July 26, 1888. As a young man he attended Guilford College and later Virginia Military Institute and the University of Virginia. He graduated from the School of Medicine, University of Maryland in 1911. He was a fellow in the American College of Surgeons, a member of the American Medical Association, past president of the New Hanover Medical Society, and a former vice president of the North Carolina Medical Society.

### ARTHUR HEBB, M.D.

Dr. Arthur Hebb, B.M.C., Class of 1898, died on April 24, 1944. He was proctologist of the Johns Hopkins medical clinic, and served in the same capacity at St. Joseph's, Maryland General, and Bon Secours hospitals, and the Church Home and Infirmary.

A member of one of the oldest families of St. Mary's County, Dr. Hebb was a descendant of Vernon Hebb, a British midshipman who, with Lawrence Washington, brother of President Washington, and John Coad, also a midshipman, came to this country in early colonial times and settled in Southern Maryland.

When a boy Dr. Hebb attended Sheib's and Deichmann's schools before taking his medical course. He was a former president of the Medical Alumni Association and a member of the College of American Physicians and Surgeons.

### H. H. LONGSDORF, M.D.

Dr. H. H. Longsdorf, one of the last of the old fashioned country doctors, died at his home in Centerville, Pa. on April 24, 1944 at the age of 85 years.

Dr. Longsdorf was one of few living persons who heard Lincoln's Gettysburg address. He was present on that memorable occasion with his father, the late Dr. W. H. Longsdorf, who was then on crutches as the result of injuries suffered in the war as a Union soldier. The President summoned father and son to the speakers' platform when he noticed the wounded veteran in the crowd.

Dr. Longsdorf received his degree in medicine in 1882 from the College of Physicians and Surgeons and was in active practice for sixty-two years.



William Turner Wootton, M.D.

## O. T. SPROULL, M.D.

Dr. O. T. Sproull, aged 81, Adams County's oldest practicing physician, passed away at West Union, Ohio on March 8, 1944. He was a life-long resident of this county and taught school for several years before entering the College of Physicians and Surgeons. In 1886 he received his degree in medicine and engaged in active practice for fifty-eight years.

## WILLIAM TURNER WOOTTON, M.D.

Dr. William Turner Wootton, President of the Southern Medical Association, died on May 2, 1944. Dr. Wootton was a graduate of the Class of 1899 of the School of Medicine of the University of Maryland, and a native of Poolesville, Maryland.

An outline of his interesting and useful career appeared in the April, 1943 issue of this Bulletin when he became President-Elect of the Association. Dr. Wootton was a man who had served his country as a soldier, was a most capable internist, and outstanding in his interest in national and civic affairs. His widow, Mrs. Emma Whittington Wootton, resides at Hot Springs National Park, Arkansas. Two daughters, and two grandchildren also survive. Dr. Wootton was an old and valued friend of the present Dean of the School of Medicine.

**Austin, Samuel Cecil**, Charleston, W. Va.; P. & S., class of 1908; aged 66; died, March 11, 1944, of injuries received in an automobile accident.

**Barker, Frank Talmadge**, Tampa, Fla.; class of 1919; aged 47; died, suddenly on January 5, 1944, of coronary thrombosis.

**Berman, Harry S.**, Detroit, Mich.; P. & S., class of 1914; served during World War I; aged 54; died, February 16, 1944.

**Coffey, Michael Joseph**, Newark, N. J.; B.M.C., class of 1909; aged 65; died, March 2, 1944, of hypostatic pneumonia.

**Dorminy, Edwin J.**, Fitzgerald, Ga.; class of 1890; aged 76; died, January 13, 1944 following a laminectomy.

**Earle, Curran Bertram**, Greenville, S. C.; class of 1896; served during World War I; aged 68; died, March 21, 1944, of heart disease.

**Gillson, Hugh Vincent**, Paterson, N. J.; class of 1914; served during World War I; aged 55; died, February 18, 1944, of carcinoma.

**Greer, Norborne Taliaferro**, Rocky Mount, Va.; class of 1892; aged 75; died, January 25, 1944.

**Kerrigan, John Joseph**, Fall River, Mass.; P. & S., class of 1906; aged 65; died, January 6, 1944, of pulmonary embolism and chronic myocarditis.

**Marshall, Charles Benton**, Nitro, W. Va.; class of 1920; aged 49; died, February 5, 1944, of cerebral hemorrhage.

- Morrison, Philo P.**, Hallsville, Texas; class of 1889; aged 79; died, February 26, 1944, of injuries received in an automobile accident.
- Patrick, George Riddle**, Bessemer City, N. C.; class of 1916; served during World War I; aged 53; died, February 5, 1944, of coronary thrombosis.
- Sappington, Purnell Fletcher**, Perry Point, Md.; class of 1887; served during World War I; aged 79; died, January 23, 1944, of coronary disease and arteriosclerosis.
- Schlutz, Frederic William**, Chicago, Ill.; class of 1902; aged 63; died, March 8, 1944, of heart disease.
- Steiner, Frederick William**, Havre de Grace, Md.; P. & S., class of 1907; aged 65; died, November 25, 1943, of injuries received in an automobile accident.
- West, Levin**, Frederick, Md.; class of 1886; aged 79; died, January 30, 1944, of cerebral embolism.



# BULLETIN

OF THE

## SCHOOL OF MEDICINE

UNIVERSITY OF MARYLAND

Vol. 29

October, 1944

No. 3

### CLINICAL USE OF DICUMAROL\*†

WITH AN ANALYSIS OF FORTY CASES

WILFRED H. TOWNSHEND, JR., A.B., M.D. AND ALVIN H. HONIGMAN,  
B.S., M.D.

BALTIMORE, MD.

In 1921 Roderick (16) in this country and Schofield (17) in Canada, working independently, determined that hemorrhagic disease in cattle was the result of eating hay made from normal sweet clover which had been cured improperly. Roderick went even further and showed that this condition was associated with delayed coagulability and reduction in the prothrombin content of the blood. It was recognized that the hemorrhage could be controlled if the spoiled clover was removed from the diet and the freshly drawn blood serum of healthy animals injected.

In 1934 Link (10) and his associates at the Wisconsin Agricultural Experimental Station of the University of Wisconsin began the study of the substance in order to identify and possibly synthesize it. Through their work and investigation it was found that coumarin was the compound that undergoes change with the formation of a hemorrhagic agent when normal sweet clover spoils. It was not until 1941, however, that they were able to isolate and begin the synthesis of the hemorrhagic agent. This agent was dicoumarin [3,3'-methylene-bis-(4-hydroxycoumarin)], (Fig. 1), a white, crystalline compound, readily soluble in alkaline solutions and only slightly soluble in water which, when taken internally, has definite prothrombin reducing properties. During the past few years the name dicoumarin has been changed to dicumarol.

The effect of dicumarol now seems to be on the prothrombin only, and this

\* From the Department of Medicine, School of Medicine, University of Maryland.

† Received for publication August 3, 1944.

is caused either by a destruction of the prothrombin, or by the inhibition of the formation of or action of prothrombin. Bingham, Meyer, and Pohle (4) advanced the possibilities that the formation of prothrombin in the liver is physiologically inhibited, and that the latent period, twenty-four hours or more, before detectable change is noted in the prothrombin time may represent a period necessary for the using up of the prothrombin in the blood. The latent phase may also be attributed to the need for dicumarol to undergo certain changes before it is capable of acting, or some mechanism may be set up which inhibits the action of dicumarol against prothrombin but later fails to continue its protection. Another possibility is that prothrombin may be inactivated by dicumarol, as well as any vitamin K present or synthetic vitamin K taken later. Barker, Allen, and Waugh (2) also believed that the increase in the prothrombin time is apparently the result of suppression of the formation of prothrombin. Since the liver plays an essential role in the elaboration of prothrombin it may be assumed that dicumarol acts in some manner to suppress or inhibit the formation of prothrombin by the liver.

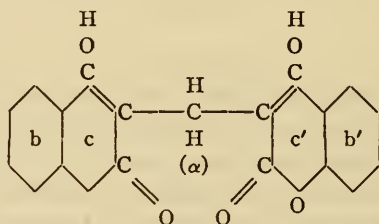


FIG. 1. THE CHEMICAL FORMULA OF DICUMAROL

As far as the various workers have been able to study this substance there has been little or no evidence of direct toxicity. In fact, Link has shown that animals given dicumarol over a period of six to seven years were well at the end of that time and lived to die of normal old age without any damage to the internal organs. Others working along these same lines have shown that even in animals given fatal doses of the drug there was no disturbance of the microscopic structure of the liver, kidneys, or other organs, unless hemorrhage occurred directly in them. The most dangerous sign in any patient is that of hemorrhage, which is usually seen only after large doses of the drug have been given. Other than this there are few toxic signs, and there seems to be little danger in using the drug if it is watched carefully and repeated prothrombin determinations are made. There have been some recorded findings of urticaria and headache. Wright and Prandoni (20) reported that most frequently the earliest signs were lassitude and general malaise, with aching in the costo-vertebral angle. The only other sign which has occasionally been mentioned is that of nausea but, as a rule, this has not been severe enough to necessitate discontinuance of the drug.

In support of the above findings, Bingham, Meyer, and Pohle (4) and Allen, Barker, and Waugh (1) have also shown that hepatic function, the composition of the urine, the nonprotein nitrogen level in the blood, the blood sugar level, the erythrocyte and leukocyte counts, the concentration of bilirubin and calcium in the serum, the icteric index, and the fragility of the erythrocytes and blood platelets are uninfluenced when dicumarol is administered. Generally the bleeding time was not influenced but the sedimentation rate was almost always increased. There was definite retardation of clot retraction in many instances of their cases but this was an inconsistent finding. Coagulation time frequently is prolonged, but this also is not a consistent finding and does not parallel the rise in prothrombin time. The coagulation time usually does not become increased until large doses of dicumarol have been given.

The use of dicumarol has been found to be particularly suited to any thrombotic emergency case in which thrombosis is expected or has already developed. In some cases, and in particular operative procedures such as embolectomies, heparin must be used until the initial latent period of dicumarol is passed. Heparin is then usually discontinued because of the great expense of the drug and because of the careful attention that it requires of the staff. Dicumarol, on the other hand, is inexpensive and can be given by mouth without too much attention or careful watching other than obtaining repeated prothrombin determinations.

There have been numerous reports by various investigators of the results of dicumarol therapy, most of which have been favorable. Barker (3) reported 624 surgical patients treated with dicumarol at the Mayo Clinic during the immediate postoperative period. "One hundred and eleven of these patients had pulmonary embolism or infarction, and had survived. In such cases it has been shown that the risk of further thrombosis, with or without embolism is high (43.8 per cent), and that the risk of subsequent fatal embolism is 18.3 per cent. In only two of the eleven cases was any subsequent thrombosis encountered, and in both of these instances the prothrombin time was probably not adequately elevated. No fatal embolism was encountered in the group of cases in which dicumarol was administered. Dicumarol was given to eighty-three patients who had postoperative thrombophlebitis. The expected statistical incidence of further thrombosis and embolism in this group of patients was 31 per cent, and the expected incidence of fatal embolism 5.7 per cent. Further thrombophlebitis developed in only two of the cases in this group, while the prothrombin times were elevated, and embolism did not develop in any of the cases.

"A third group of thirty patients who received dicumarol had had thrombophlebitis or pulmonary embolism following a previous operation, or from any cause during the year prior to the immediate operation. Thrombosis or embolism did not develop in any of these thirty cases.



"A fourth group consisted of 259 patients who had undergone abdominal hysterectomy. In this group dicumarol was given purely for prophylactic purposes, since none of these patients had had evidence of thrombosis or embolism previously. The expected incident of thrombosis and embolism in this group of patients was 4 per cent, of fatal embolism 0.7 per cent. Thrombosis or embolism did not develop in any of these cases.

"A fifth group of 141 patients, who had undergone various other types of operations and who, because of obesity, varicose veins, anemias, heart disease, or because of unavoidable trauma to veins at the time of operation were felt to be increased risks for postoperative thrombosis and embolism, also received dicumarol for prophylactic purposes. In none of these cases did postoperative thrombosis or embolism develop."

Barker then points out, from his experience with the above cases, that by increasing the prothrombin time through the administration of dicumarol, postoperative thrombosis and embolism are almost completely prevented. His experiences with dicumarol also support the concept that embolism develops only when there has been recent thrombus formation, and that embolism can be prevented in thrombophlebitis and other thrombosis if the extension of the thrombosis is prevented. There was no evidence in his cases to show that dicumarol had any effect on thrombosis or embolism that had already occurred.

Lehmann (13) in England reported that "Dicumarol was given to 100 cases of established venous thrombosis in the lower limb and thirty-two cases of thrombophlebitis. In thrombosis the mean recovery time was one to three weeks, a third of what it was before anticoagulants were used, and in thrombophlebitis six and one-half days. The dicumarol was also given prophylactically to 170 patients in 1942 after gynecological operations, and only one case of venous thrombosis and one case of embolism was seen, with no deaths. In 1941 there had been nine cases of thrombosis and five of embolism, with three deaths in a comparable series."

Experimentally, Thill (18) and his co-workers have shown that dicumarol definitely inhibits thrombus formation in dogs. They showed that when sodium morrhuate was injected intravenously in dogs, thrombosis rapidly occurred, but when injected into dogs which had received adequate doses of dicumarol there was no evidence of thrombus formation.

The administration of dicumarol is usually by mouth, but the disodium salt can be given by vein and there have been several cases reported (15) whereby the drug has been successfully given rectally in a water suspension or in suppositories. The drug is dispensed in capsules and the usual plan of administration is 300 mg. given at the time the diagnosis is made, 200 mg. the second day, and 100 mg. the third day. Following this the dose usually depends on the prothrombin time. On days when the prothrombin rate is



over thirty-five seconds no dicumarol is given; on days when the prothrombin time is below thirty-five a dose of 50 to 200 mg. is given, depending on the individual tolerance. Changes in this plan of therapy may be made if the prothrombin time is falling rapidly; a dose may be given even though the time is slightly more than thirty-five seconds. Likewise, if the prothrombin time is rising rapidly and is not yet thirty-five seconds, the dose may be omitted.

TABLE I

*Diagnosis in Forty Cases Treated with Dicumarol Alone or Combined with Heparin*

DIAGNOSIS	NUMBER OF CASES
Thrombophlebitis	
Postoperative.....	7
Postpartum.....	1
Other.....	9
Coronary Thrombosis	
Postoperative.....	0
Postpartum.....	0
Other.....	3
Cellulitis of face.....	2
Prophylaxis (following repair of iliac vein).....	1
Pulmonary Embolism	
Postoperative.....	6
Postpartum.....	2
Other.....	3
Subacute Bacterial Endocarditis (multiple embolization).....	2
Arterial Embolism	
Postoperative.....	1
Other.....	2
Suspected Venous Thrombosis	
Postoperative.....	1
Total Number of Cases.....	40

The main complication that arises from the use of dicumarol is hemorrhage. This may be only slight or may present a serious problem. In any event, the drug should be stopped immediately and, if serious, transfusions of fresh blood should be given. Vitamin K has been shown to be of no value in the treatment of hemorrhage caused by dicumarol. Minor cases of hemorrhage, such as microscopic blood in the urine, usually cease and clear up once the drug is discontinued and transfusions are, as a rule, not necessary.

Contraindications to the use of dicumarol are few. It should not be used in:

A. Renal insufficiency from any cause

- B. Purpura of any type
- C. Blood dyscrasia with a tendency to bleeding
- D. Cases where there is already an existing prothrombin deficiency which might recur in diseases of the liver
- E. Subacute bacterial endocarditis

Other contraindications, in which the outcome is less serious if bleeding occurs, are:

- A. The existence of ulcerative lesions and open wounds which have a potential bleeding surface
- B. Operations on the brain and spinal cord
- C. The necessity for repeated surgical operation in the next one to two weeks

In the University Hospital approximately sixty patients have been treated with dicumarol,\* forty of whom are included in this report; the balance is omitted because of incomplete work at this time. All patients treated had developed some form of thrombosis or were suspected of having thrombosis because of embolic phenomena. Three were treated prophylactically. Table I indicates the various types of cases treated and the number of each type treated. The prothrombin time in all cases was determined according to the method described by Quick.

The following cases are representative of results obtained and also reveal several complications which are attributable to the improper administration of dicumarol.

#### CASE REPORTS

*Case No. 1:* H. R., No. 61,203, a 46 year old white male, was admitted to the medical service on April 16, 1943 with the complaint of hemoptysis, chills, fever, and pain in the left chest of six days' duration. He was found to have lobar pneumonia in the base of the left lung, and Type II pneumococcus was demonstrated in the sputum. The patient was placed on sulfonamide medication and given the usual supportive therapy. He improved clinically but continued to have a low grade fever. On April 29 he complained of pain in the left leg, and examination at that time revealed a swollen, red, hot left lower extremity, with pitting edema about the left ankle. This edema progressed during the next two days and by May 1 had involved all of the left lower extremity up to the hip. Elevation of the leg and the application of dry heat by means of a cradle and light afforded some relief but did not stop the progression of the edema. By May 3 the edema had involved the left lower abdominal wall and indeed had extended almost to the left axilla. The pain in the extremity was severe and the oral temperature was 101.2 F. Because of the rapidly progressing edema the administration of heparin was started by intravenous drip on May 3. Initially the bleeding time was three and a half minutes and the clotting time was three minutes. By 7:30 A.M. on May 4 the clotting time had increased to fifteen minutes and

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\*The supply of dicumarol was furnished by Eli Lilly and Company, and by Abbott and Company.

the rate of flow of the heparin was reduced from 20 to 8 drops per minute. The patient was given 500 mg. of dicumarol on May 4, 200 mg. on May 5, and 200 mg. on May 6. By May 5 the prothrombin time had reached twenty-nine seconds, with a control of fifteen seconds. The heparin was discontinued on May 6 and the patient was maintained on daily doses of dicumarol. From May 3 to May 6 there was some extension of the edema in the left side of the abdomen, with the appearance of reddish discoloration of the edematous area. By May 7 the patient no longer complained of pain in the leg or abdomen. There was also a noticeable decrease in the edema of the abdomen and leg. The temperature was normal on May 7. The next day the swelling in the leg was much less and there was considerable reduction of the redness and edema of the abdominal wall. By May 10 the swelling of the abdominal wall had disappeared entirely and the leg was much smaller in circumference. On May 15 all of the soreness and edema had disappeared from the left leg. The patient still had evidence of pulmonary congestion and was therefore kept in bed until May 27. He was allowed to sit up at this time and began walking on June 4. The remainder of the course was negative as far as thrombophlebitis was concerned and the patient was discharged on June 8, 1943.

This case illustrated the potentialities of anticoagulant therapy. The edema, redness, and pain were all progressive, and five days after the process began in the left leg had extended to involve the left anterior abdominal wall. This occurred in spite of elevation of the extremity and the application of heat. Anticoagulant therapy was started on May 3, the fifth day of the phlebitis. Extension of the edema continued until May 6, when the prothrombin time reached thirty seconds. From then on the patient no longer complained of pain and the edema began to subside. By May 10, seven days after the institution of anticoagulant therapy and four days after an adequate prothrombin level had been reached, all of the edema of the abdominal wall had disappeared; five days later all of the edema and soreness had disappeared from the leg.

*Case No. 2:* J. H., No. 59,962. This 40 year old white male was readmitted to the University Hospital on March 3, 1943 because of pain in the left lower quadrant and epigastric pains of six days' duration. The patient was previously discharged from the hospital on February 27, 1943 following an uneventful and afebrile postoperative course of sixteen days after a bilateral hernioplasty. On examination March 3, 1943 the lungs were clear to percussion and auscultation but a roentgenogram revealed possible early pneumonia in the base of the left lung. The operative sites were entirely uncomplicated, and both femoral areas and legs were normal and without tenderness. The patient was started on sulfathiazole, and given an enema which was effectual. The epigastric pain improved, as did the respiratory condition. On March 8, 1943 pain began to develop in the upper medial thigh and the temperature rose to 101.4 F. On March 9, 1943 the pain was more severe and was located in the calf of the right leg. There was evidence of slight edema and increased local heat. The administration of one grain of desiccated thyroid twice daily was started, and the right leg elevated and surrounded with ice bags. The temperature continued to rise and the leg became more swollen and tense. On March 10 a paravertebral block was done but the patient failed to improve. On March 11 the administration of sulfathiazole was discontinued and the use of sulfadiazine was begun. The patient continued to have increased edema of the right leg and the level of the femoral tenderness began to climb above the inguinal ligament for two inches as a climbing thrombus. At 7:00 P.M. on March 13 he was placed on 300 mg. of dicumarol and one grain of desiccated thyroid daily; the temperature at this time was 102 F. In two and a half days the temperature was normal and remained so for the rest of the course in the hospital. Sulfadiazine therapy was discontinued on March 19 and the patient was discharged as improved on March 29, 1943. The prothrombin time the day after dicumarol was started was thirty seconds, with



a control of fifteen seconds. On March 16 the prothrombin time was forty seconds. The quantity of dicumarol was reduced to 150 mg. daily on March 16 and discontinued on March 19. On March 17 the prothrombin time was fifty seconds and sixty-five seconds on March 18. Three ampuls of vitamin K were given on March 20 and the prothrombin time was forty-three seconds on March 22 and twenty-seven seconds on March 24, 1943. At discharge the prothrombin time was seventeen seconds. There was no appreciable change in the bleeding and clotting times.

This case illustrated the usual response of thrombophlebitis to dicumarol therapy. There was extension of the edema and continuance of the fever for five days after the thrombophlebitis began in spite of a paravertebral block, the application of heat, and sulfonamide therapy. Two days after dicumarol was first administered the temperature became normal and the edema began to recede.

*Case No. 3:* H. M., No. 70,574, a 34 year old white male, was admitted to the surgical service on March 19, 1944 because of symptoms similar to left-sided renal colic of three weeks' duration. He was thought to have a calculus of the left kidney, although a roentgenogram of the abdomen revealed no radiable calculi. An intravenous pyelogram showed a peculiar defect of the ureters, with deviation of the left ureter medially and of the right ureter laterally. A retrograde pyelogram was made under spinal anesthesia, and with the relaxation of the abdomen a large mass was palpable in the midline. An exploratory laparotomy was done later and a large teratoma with malignant changes was found. In trying to free this mass the right iliac vein was inadvertently torn into and had to be repaired by suture. The rest of the operation proceeded well and the patient was returned to his room in good condition. Because of the trauma to the vein at operation and in an effort to prevent thrombus formation, heparin by continuous drip was started postoperatively; 300 mg. of dicumarol was also given on March 22, and 200 mg. on March 23; 20 cc. of heparin was administered over the first two postoperative days. The prothrombin time reached thirty-eight seconds, with a control of fifteen seconds by March 25. The patient was maintained on dicumarol therapy until the fifth postoperative day. He had no signs of venous thrombosis and had an uneventful postoperative course. He was discharged on April 6, 1944.

In this instance the prophylactic use of anticoagulants was demonstrated. Although definite trauma was done to the vein which usually would result in thrombus formation, none occurred here after heparin and dicumarol were given postoperatively. In two other cases reported in this series, but not described in detail, dicumarol was given prophylactically. Those two had severe cellulitis of the face, in which the complication of venous sinus thrombosis is always feared. On anticoagulant therapy plus sulfonamide medication recovery was rapid and the patients had no complications. It is interesting to point out that in the University Hospital in the same month there was one death caused by venous sinus thrombosis following cellulitis of the face. This patient had been on sulfonamide therapy and was to have been started on anticoagulants. Respiration ceased, however, just as heparin was being started.

*Case No. 4:* E. B., No. 62,414. This 58 year old white female was admitted to the surgical service on May 31, 1943 with the diagnosis of carcinoma of the head of the pancreas and diabetes mellitus. An exploratory laparotomy was made on June 4 and cholecystitis with cholelithiasis and partial spontaneous cholecystoduodenostomy were found. Choledochotomy and repair of the duodenum were done. Five days postoperatively, on June 9, the patient complained of pain in the right arm extending down the hand. On examination the hand was cold and cyanotic. No radial pulse or blood pressure was obtainable in the right arm. The blood pressure in the left arm was 124 mm. of mercury



systolic and 100 mm. diastolic. The diagnosis of embolus to the right radial artery was made and the patient started on heparin and dicumarol. Heparin was administered intravenously in saline and 40 cc. was given in the following forty-eight hours. The clotting time, which initially was one and three-quarter minutes, rose to twenty five minutes twelve hours after the institution of heparin therapy. Dicumarol was given in doses of 200 mg. daily, and on June 12 the prothrombin time was twenty-four seconds, with a control of fifteen seconds. Heparin therapy was stopped on June 11; dicumarol was continued for five days, with daily doses of 200 mg. Besides anticoagulant therapy the patient was also given papaverine and physiotherapy with the pavex machine. She developed a line of demarcation involving the first, second, and third fingers of the right hand approximately 1 cm. proximal to the metacarpophalangeal joint, and this area proceeded to develop dry gangrene. The rest of the extremity regained its color and warmth and pulsations were again present. The patient had a complicated postoperative course characterized by severe phlebitis and uncontrollable diabetes mellitus. She was discharged on the thirty-fifth day with instructions to return later for amputation of the gangrenous areas.

*Case No. 5:* G. T., No. 56,971, a 21 year old colored female, was admitted to the medical service on November 12, 1942 because of dyspnea and pain in the right upper quadrant of the abdomen. On complete examination the patient was found to have rheumatic heart disease. She was given digitalis and was progressing satisfactorily on the regime planned for her until November 29, 1942, almost three weeks after admission. That evening, following supper, she suddenly noticed pain in the right arm and forearm. Shortly after this her fingers became numb and cold. An examination at this time revealed that the patient failed to have any radial pulse in this arm and the blood pressure was not obtainable; the pulse rate and blood pressure were good in the left arm. The subclavian artery and the axillary artery could be palpated in the axilla but no pulsations were palpable in the arm. It was thought that she had an embolus in the right brachial artery and that there was threatened gangrene of the right arm and forearm. An embolectomy and an arteriorrhaphy were done. Heparin was administered intravenously in saline during the operation, and 50 cc. in saline was given postoperatively over the course of the first two postoperative days. Dicumarol therapy was started on December 1, two days after the operation; 300 mg. was given daily for three days. The clotting time rose to twenty minutes. The blood pressure in the right arm was 135 mm. of mercury systolic and 90 mm. diastolic. The prothrombin time on December 3 was thirty-five seconds, with a control of twenty-two seconds. A pavex machine was also used on this patient. Immediately after the operation no radial pulse could be palpated. The arm became warm and a radial pulse was perceptible the day following operation. The patient's course was uneventful following operation and she was allowed to sit up on January 5, 1943. On January 9, 1943, just as the patient was about to get out of bed, she suddenly fell over and respiration ceased almost immediately. No autopsy was obtained.

These two reports illustrated the use of anticoagulants in cases of arterial emboli. In both patients there was a sudden onset of pain in the extremity, with coldness, cyanosis, and loss of pulse rate and blood pressure. Anticoagulants were started after the diagnosis was made in each instance. In Case No. 5 an embolectomy was performed. Within twenty-four to forty-eight hours after anticoagulant therapy was begun these two patients had a return of arterial pulsation, blood pressure, and warmth. In the case of the embolectomy no residual effects occurred; in Case No. 4, however, the patient developed dry gangrene of three of her fingers. This patient had a fairly severe case of diabetes. In Case No. 5, death occurred probably from massive pulmonary embolism one month after the discontinuance of dicumarol therapy.

*Case No. 6:* M. J., No. 69,439. This 60 year old white female was admitted to the private medical service on February 6, 1944 because of precordial pain, nausea, vomiting, and shortness of breath. The blood pressure on admission was 190 mm. of mercury systolic and 110 mm. diastolic; the leukocyte count was 19,000. The temperature, pulse rate, and sedimentation rate were moderately elevated. The impression on admission was myocardial infarction, which was confirmed by an electrocardiogram. One week after admission there was a secondary rise in temperature, followed by pain in the lower right side of the chest and signs of pulmonary infarction. The following day there was bloody sputum. A roentgen ray examination was made and the impression of pulmonary infarction in the base of the right lung was confirmed. The patient was started on dicumarol on February 17 and maintained thereon until February 25, with a subsidence of all symptoms and return of the temperature to normal. The patient was given 300 mg. on February 17, 100 mg. on February 18, and 100 mg. on February 19. On February 19 the prothrombin time was thirty-one seconds, with a control of twelve and a half seconds. The prothrombin time was allowed to return to normal by February 29. From March 5 to March 8 there was another rise in temperature, with pain and signs of pulmonary infarction at the lower left axilla; the impression was confirmed by a roentgenogram. Dicumarol therapy was again started on March 8 and continued until March 30. The temperature remained normal throughout the rest of the hospital stay. The prothrombin time was kept at a level of twenty-five to thirty-five seconds, with an average control of fourteen seconds. This patient was discharged on the sixty-second hospital day.

*Case No. 7:* E. A., No. 64,447, a 55 year old white female, was admitted to the private gynecologic service on August 5, 1943 for repair of a ventral hernia and for ligation of bilateral varicose veins. The operation on August 11 consisted of a biopsy of the cervix, repair of the ventral hernia, and bilateral saphenous ligation with retrograde injection. The postoperative course was uneventful until the eighth postoperative day, when the patient complained of pain in the right side of the chest posteriorly. The pulse rate was elevated to 120 per minute and the temperature rose to 102 F. Respiration increased and the patient became shocked and apprehensive. Examination at that time revealed a flat percussion note at the base of the right lung, suppression of the breath sounds, and many crepitant râles. An impression of infarction of the base of the right lung from pulmonary embolism was made and confirmed by roentgen ray examination. On August 20 the patient was started on heparin by continuous intravenous drip in physiologic saline and given 300 mg. of dicumarol. The prothrombin time initially was sixteen seconds, with a control of fifteen seconds; the initial clotting time was six minutes. She was given 30 cc. of heparin over the course of the next two days. The clotting time rose to fourteen minutes by August 21 at 8:00 A.M. The patient was also given 200 mg. of dicumarol on August 21 and 200 mg. on August 22 and 23. The prothrombin time had reached forty-six seconds with a control of fifteen seconds by August 22 and the heparin was discontinued. She improved greatly on the dicumarol therapy and on August 21 the temperature and pulse were normal and all pain had disappeared. Although no additional dicumarol was given after August 23 the prothrombin time reached ninety-five seconds on August 27 and an examination of the urine showed gross hematuria. The temperature increased to 101 F. on August 29. An examination of the chest revealed flatness to percussion and suppression of the breath sounds at the base of the right lung. A thoracentesis was done and 500 cc. of bloody fluid removed. Following this the patient had an uneventful course and was discharged on September 8.

In these two patients there was definite benefit derived from the use of dicumarol. Both had definite pulmonary infarction, the infarction in one case complicating coronary thrombosis and in the other occurring nine days postoperatively. In both cases once dicumarol therapy was started the temperature returned to normal and the patients were symptom-

free. In Case No. 6 one week after the prothrombin time was allowed to return to normal there was a subsequent infarction, with occurrence of pain and elevation of the temperature. When dicumarol was begun the pain and temperature disappeared and the patient's course remained uneventful during the rest of the hospital stay. In Case No. 7 the prothrombin time became greatly elevated, although the patient did not receive an excess of dicumarol. The prolonged prothrombin time was followed by gross hematuria and hemorrhagic pleural effusion.

*Case No. 8:* H. B., No. 66,434. This patient, a 32 year old white female, was admitted to the private medical service on October 10, 1943 because of painful swelling of the left leg and thigh. Three weeks prior to admission she had been delivered of a full term living child. Her postpartum course was complicated by a perineal infection. Two days prior to discharge the patient noticed cramps in the posterior region of her left thigh. She was discharged on October 3, 1943 with instructions to remain in bed for the next week. On October 5 the left leg began to swell and became painful. Examination on admission revealed the left lower extremity to be swollen and warm from the toe to the groin. The entire leg was tender, with considerable tenderness over the saphenous vein. Pulsations were present in the peripheral arteries. There was no pitting edema. The leukocyte count was 25,800. Her temperature was 100.2 F. and the pulse rate 100 per minute. The diagnosis of thrombophlebitis was made and the patient was started on heparin and dicumarol. The heparin was given by continuous intravenous drip and 40 cc. was administered in saline over the next three days. A standing order was placed for 300 mg. of dicumarol every six hours for six doses, the patient receiving 1800 mg. over the course of the next thirty-six hours. The clotting time, which initially was five minutes, rose to fifteen minutes on October 11 at 10:00 P.M. and thereafter the rate of flow of the heparin was adjusted so that the clotting time was maintained at ten minutes. By October 13, forty-eight hours after the administration of dicumarol, the prothrombin time was thirty-two seconds with a control of eighteen seconds. Heparin therapy was discontinued on October 14 and the patient was maintained on doses of dicumarol. On October 16 the prothrombin time was over 300 seconds; the clotting time was then five minutes. A urinalysis proved negative. The prothrombin time gradually returned to normal and by October 29 the prothrombin time and the control time were each seventeen seconds. Four days after anticoagulant therapy was begun the pulse rate and temperature had reached normal limits and there was definite improvement in the edema of the leg. The patient continued to progress slowly and was discharged on the twenty-sixth hospital day.

*Readmission:* No. 67,142. Two days following discharge, November 7, 1943, the patient was readmitted because of a sudden onset of shortness of breath which had occurred after dinner. This was accompanied by weakness, apprehension, pallor, and profuse perspiration. On readmission the respirations were rapid, but both the physical and roentgen examinations of the chest were essentially negative. The leukocyte count was 10,000 and the temperature was 98 F. Because of the symptoms and the history of thrombophlebitis the patient was started on heparin and dicumarol. Heparin was continued by intravenous drip over the course of the next four days. The clotting time rose to twenty minutes from an initial time of three minutes on the second day after heparin therapy was started. Dicumarol was administered in doses of 200 mg. on November 8 and 9. The prothrombin time on November 10 was forty seconds, with a control of twenty-three seconds. The patient was entirely symptom-free while in the hospital and was discharged on the nineteenth hospital day.

*Note:* During the first admission, because of the initial low hemoglobin count the patient received several blood transfusions. These were given without effort to obtain fresh blood and there was no appreciable change in the prothrombin times.



This case illustrated the use of anticoagulants in thrombophlebitis occurring postpartum. In this instance there was a beneficial but slow response to anticoagulant therapy. From these results one also can see the danger of leaving dicumarol as a standing order. The dicumarol was given every six hours in doses of 300 mg. each, hence the patient received 1800 mg. in thirty-six hours. Fortunately, no evidence of hemorrhage was noticed although the prothrombin time rose to over 300 seconds. Even though the readmission is listed as a case of subsequent embolism it was never definitely proved that the patient had a pulmonary infarction, and her presenting symptoms on readmission may have been caused by psychogenic factors.

*Case No. 9:* P. M., No. 64,486. This 39 year old colored female was admitted to the gynecologic service on August 6, 1943 for a panhysterectomy for uterine fibroids and squamous cell carcinoma of the cervix. The operation was performed on August 10, 1943 and the postoperative course was uneventful until August 17, the seventh postoperative day, when the temperature rose to 101.2 F; the pulse rate was 120 per minute, and respiration became rapid and shallow. The patient was nauseated and vomited and the abdomen became distended. Efforts to relieve the distention were only moderately successful and throughout the next day, the eighth postoperative day, the respiration remained elevated, averaging from 45 to 55 per minute. Although a roentgen ray examination was negative it was thought that the patient may have had a pulmonary infarction. The leukocyte count was 12,600. Dicumarol therapy was started on August 18, 300 mg. being given on this date and 200 mg. each day for the next three days. The prothrombin time on August 19 was sixteen seconds, with a control of fifteen seconds. Her condition seemed improved somewhat for the next two days, the temperature, pulse rate, and respiration all being slightly elevated. During the evening of August 21 the patient's temperature rose to 102.2 F. and she began to complain of abdominal pain. The prothrombin time on August 21 was seventy-two seconds, with a control of fifteen seconds. On the next day a small amount of bloody drainage was discovered escaping from the abdominal incision. The sutures were removed and 200 to 300 cc. of foul smelling pus was expressed. A small amount of bleeding took place and a rubber drain was inserted. The incision continued to drain for the next two days and the temperature remained elevated. The patient complained of weakness and the hemoglobin count dropped to 66 per cent, therefore 500 cc. of citrated blood was given on August 24. The prothrombin time remained about sixty seconds, with a control of fifteen seconds over August 22, 23, and 24. On August 26 she again complained of abdominal pain and on examination a large mass approximately 12 cm. in diameter was palpated beneath and to the left of the abdominal incision. About 3 cm. of the incision was opened with a clamp and 60 cc. of dark, old blood was expressed. Four hours later this area was the site of fairly profuse bleeding. The hematocrit reading was 18, the hemoglobin was 60 per cent, and the prothrombin time was seventy-nine seconds, with a control of fifteen seconds on August 26. The patient was given 500 cc. of plasma and 1000 cc. of fresh citrated whole blood during August 26. The bleeding was thought to be attributable to the combined result of infection and necrosis of the abdominal wall, and to the prolonged prothrombin time. Two ampuls of hykinone or 8 mg. were given every four hours for four doses on August 26, and two tablets of Kayquinone or 2 mg. were given three times a day for two days. The prothrombin time on August 28 was eighteen seconds, with a control of fifteen seconds. The patient improved gradually and the wound finally healed. The postoperative course was further complicated by pneumonitis, from which the patient recovered. She was discharged on November 30, 1942.

This case demonstrated one of the chief complications of dicumarol therapy and the treatment of the complication. In this instance dicumarol was given even after the prothrombin time had reached seventy seconds, the patient receiving 200 mg. on the afternoon



of August 21. This elevation in prothrombin time resulted in bleeding into the abdominal incision, with the formation of a hematoma in the wound. The transfusion of fresh whole blood plus hykinone was given on August 26, the prothrombin time dropping from seventy-three seconds on that date to eighteen seconds on the next day. It is important to remember that when there is an open wound or a postoperative incision dicumarol must be administered cautiously and each dose given only after the morning prothrombin time has been obtained. When any sign of bleeding into the wound is found, transfusions of fresh whole blood should be given.

*Case No. 10:* W. H., No. 70,105, a 74 year old white male, was admitted to the medical service on March 1, 1944 because of unregulated diabetes mellitus and beginning gangrene of the left foot. The presence of diabetes was unknown until two months prior to admission, when he consulted his family physician because of an infection of the left foot and the result of the test for sugar in the urine was found to be 4 plus. Hospitalization was advised at that time but refused and the infection progressively became worse. On admission the fasting blood sugar level was 422 mg.%. There was discoloration of the small toe of the left foot and cellulitis of the rest of the foot. A roentgenogram showed definite sclerotic changes in the vessels of the foot and osteomyelitis of the fourth and fifth metatarsal bones, with involvement of the joint and the proximal phalanx of the little toe. The left foot was cold and pulsations of the dorsalis pedis artery could not be detected. A paravertebral block was done on March 3 and dicumarol therapy was started. Both of these methods were used in an effort to increase the circulation to the foot and to prevent the spread of gangrene. Dicumarol was given in doses of 300 mg. on March 2 and 200 mg. on March 3. The prothrombin time rose to forty-nine seconds, with a control of eleven and one-half seconds on March 4. The diabetes was controlled and the infection began to clear. In the next two weeks all of the infection in the foot disappeared, the circulation increased, and there was a line of demarcation separating the gangrenous small toe from the rest of the foot. On March 21 this toe was amputated. The patient had been maintained on dicumarol therapy preoperatively and for several days postoperatively, with the prothrombin time being maintained around twenty-five to thirty-five seconds. Following operation the patient had an uneventful course and was discharged on April 8, 1944, his thirty-ninth hospital day.

Brambel and Loker (6) have shown that in trauma to or gangrene of an extremity there are certain conditions favoring thrombus formations, these being:

- A. Injury to the endothelial lining of the blood vessels
- B. Accelerated prothrombin clotting time
- C. Liberation of excess thromboplastin by traumatized tissue

These workers studied a series of cases involving various types of gangrene and trauma, classified as follows:

- A. Post-traumatic condition with associated gangrene following crush injury
- B. Diabetic and arteriosclerotic gangrene
- C. Frostbite gangrene

Experience has shown that in these cases progressive gangrene usually resulted from thrombosis of the peripheral vessels in the affected area. Dicumarol was used in this series of cases in an effort to inhibit peripheral throm-

bosis and therefore to prevent extension of the gangrene. The results were satisfactory and the authors' work suggested that the procedure of midthigh amputation in a patient with arteriosclerotic and diabetic gangrene of the toes may be supplanted by amputation at a site of election below the knee if dicumarol is administered.

This was true in Case No. 10 of the series. This 74 year old uncontrolled diabetic patient who formerly would probably have lost his leg escaped with amputation of his small toe only. In two other cases at the University Hospital not reported in this series amputation following arterial embolism, in locations not accessible to embolectomy, was done with patients on dicumarol therapy. In one case the site of amputation was considerably lower than the level first thought necessary.

### RESULTS

All patients treated received dicumarol by mouth, and of these forty patients ten also were given heparin intravenously. In all cases there was a lag of from twenty-four to seventy-two hours after dicumarol was given before a comparable increase in the prothrombin time could be seen. Figure 2 shows the average dose of dicumarol used and the resultant rise in prothrombin time during the first six days of therapy. Table II illustrates the results of this therapy in forty cases. In all there were only three cases of subsequent thrombosis and one case of subsequent embolism. There were three deaths in the forty cases; two of these were attributable to other causes and one was the result of massive pulmonary embolism. Except for four cases there was definite improvement after dicumarol therapy was started, as was noticed by decline in the temperature curve, rapid resolution of edema and evidence of thrombophlebitis, and the subsidence of pain and local heat. Patients with pulmonary infarcts seemed definitely more comfortable when given dicumarol and less dyspneic. Two cases of subacute bacterial endocarditis were treated, one of which had severe pain and evidence of multiple emboli. After dicumarol was started the evidence of emboli ceased and pain disappeared. The drug was then discontinued and after three days the symptoms returned, as well as evidence of embolization. These again disappeared when dicumarol was readministered. There were two cases of cellulitis of the face treated without any evidence of subsequent thrombosis. One embolectomy was performed, following which pulsations returned to the arm and there was no evidence of thrombus formation. The patient, however, died of a massive pulmonary embolus after dicumarol was stopped. Three patients not included in this series of forty cases had amputations as a result of emboli and thrombophlebitis. They recovered without any further evidence of thrombosis after being treated with dicumarol before and after the operation. In seven cases the prothrombin time got out of

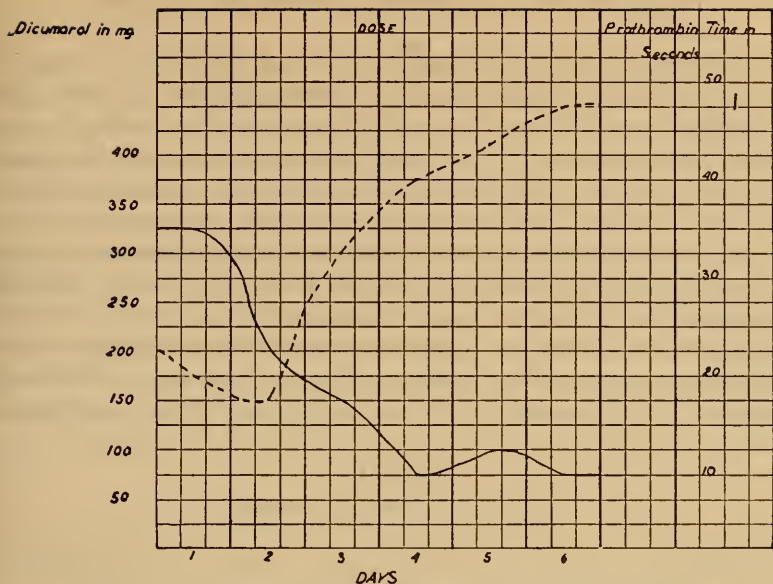


FIG. 2. THE AVERAGE DOSE OF DICUMAROL WITH THE RESULTING INCREASE IN PROTHROMBIN TIME

The solid line represents the dose of dicumarol; the broken line shows the prothrombin time.

TABLE II  
Results of Therapy

REASON FOR DICUMAROL	NUMBER OF CASES	SUBSEQUENT THROMBOSIS	SUBSEQUENT EMBOLISM	SUBSEQUENT FATAL EMBOLISM
Thrombophlebitis				
Postoperative.....	7	0	0	0
Postpartum.....	1	0	0	0
Other.....	9	0	0	0
Coronary Thrombosis.....	3	1*	0	1*
Prophylaxis (after repair of iliac vein)...	1	0	0	0
Pulmonary Embolism				
Postoperative.....	6	1	0	0
Postpartum.....	2	0	0	0
Other.....	3	0	0	1**
Subacute Bacterial Endocarditis.....	2	0	1	0
Arterial Embolism				
Postoperative.....	1	0	0	0
Other.....	2	1	0	1
Suspected Venous Thrombosis.....	1	0	0	0
Totals.....	40	3	1	3

\* Patient died of cardiac failure.

\*\* Patient died of lung abscess.

control because of the improper administration of dicumarol and failure to repeat prothrombin determinations at frequent intervals. In eight cases the prothrombin time was sixty seconds, without any evidence of hemorrhage or any other complication. Two patients were given transfusions because of hemorrhage, and one patient received a transfusion in order to prevent hemorrhage. The average elevation of prothrombin time was twelve to sixteen seconds. In three cases not included in this series dicumarol was used as an adjunct in the treatment of arteriosclerotic and diabetic gangrene.

Complications in the forty cases were few, as shown in Table III. The most serious complication was that of hemorrhage into the abdominal wound, which was controlled mainly by the transfusion of fresh blood. Vitamin K was found to be of no value in the treatment of any of the complications.

TABLE III  
*Complications Caused by Dicumarol*

	NUMBER OF CASES
Microscopic Hematuria.....	7*
Gross Hematuria.....	1
Renal Colic.....	1
Hemorrhage into Wound.....	2
Definite Drop in Hemoglobin Count.....	2**
Hemorrhagic Pleural Effusion.....	1***

\*In two of these cases the patients also had renal infarction.

\*\*In these two cases the drop in hemoglobin is probably caused by the loss of blood, one of which is not directly related to dicumarol therapy.

\*\*\*This patient previously had a pulmonary infarct and the hemorrhagic fluid may have been on this basis (Case No. 7).

In all cases in which complications were encountered administration of the drug was stopped immediately and the patient followed carefully.

#### CONCLUSION

Forty cases treated with dicumarol because of the evidence of thrombosis or as a prophylaxis against thrombosis are presented. In this series there were three deaths, none being directly attributable to dicumarol therapy. Ten patients also received heparin as an initial anticoagulant. Dicumarol was found to act just as well as heparin as anticoagulant, except for an initial latent period of twenty-four to seventy-two hours. It is considerably less expensive and much easier to administer. There is no standard dose of dicumarol, and the daily prothrombin time should be run before each daily dose is given. An effective method of administration of dicumarol is an initial single dose of 300 mg. of dicumarol, followed by 200 mg. on the



second day and 100 mg. on the third; this produces the desired effect. The dose following this depends on prothrombin determination. In all cases except four there was considerable improvement, and it is believed that dicumarol has a definite beneficial effect on the reduction of pain, local heat, and edema, as well as a reduction in temperature. There were only three cases of subsequent thrombosis and one of subsequent embolism. Complications are few; hemorrhage is the most important one and can be controlled by the transfusion of fresh blood. Vitamin K was found to be of no value in the treatment of hemorrhage caused by dicumarol.

The authors believe that the administration of dicumarol is a valuable adjunct in the treatment of thrombotic conditions and as a prophylaxis against thrombosis. It can be safely used, with little danger of complications, if careful attention is paid to the dose and the daily prothrombin determination.

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## ANESTHESIA—MAN'S REDEMPTION FROM PAIN\*

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I am honored to be here this afternoon and speak to you about general anesthesia, because in years past your profession has done so much in the development of this field. It is fitting and proper that one who is concerned with the research in anesthesia should speak to those who are concerned with the administration of anesthetic agents.

Sometimes there is a confusion of terms. This calls to my attention a story which was told concerning our battle front in Italy. An American soldier was wounded. In shock he was taken to a British hospital from the mud and horror of battle. The next day when he awoke, he looked into the eyes of a very beautiful, charming English nurse and seeing the whiteness and cleanliness of the hospital, he thought that he was surely approaching the pearly gates and inquired of the English nurse: "Did I come here to die?" And she said, "Not at all, sir. You came yesterdie."

Pain is the arch enemy of mankind. All through the annals of written history man has ransacked this entire earth in order to acquire a surcease of pain. His real struggle began in the year 1776. In medicine that was an important year. It was the year in which Mathew Dobson discovered that the sweetness of diabetic urine was due to the presence of sugar. It was the year in which Percival Pott of England made the observation that chimney sweeps suffered frequently from cancer of the scrotal skin and attributed that to the impinging of coal tar on the skin. We know now that it was the carcinogenic substances found in coal tar responsible for neoplastic growth.

And to diverge for a minute, it was an important year in economics for it was the year in which Adam Smith wrote the immortal book "The Wealth of Nations." But from the point of view of man's relief of pain it was the year in which Joseph Priestley, that Unitarian minister of England, the discoverer of oxygen, made laughing gas. Joseph Priestley looked down at his congregation on Sunday mornings and saw in his audience a great triumvirate—James Watt, who was to put to work the power of steam; Erasmus Darwin, whose grandson was to institute a new order in biology by the writing of the "Origin of Species" in 1859; and lastly, in that congre-

\* "The Horace Wells Centenary Lecture," presented before the 88th Annual Meeting of the Michigan State Dental Society, Detroit, April 17, 1944. Reprinted by permission of the Michigan State Dental Society.

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gation was William Withering, who observed that digitalis would alleviate auricular fibrillation.

Joseph Priestley did not get along very well in England, so he came to the new country and took up his residence in Philadelphia in order to obtain religious freedom. Not finding it there, he went to Northumberland County in Pennsylvania and settled. When gas rationing is over and you get your new car, dash over the Susquehanna Trail and drop in at Northumberland and see that shrine erected to Joseph Priestley. The placard reads, "It was here Priestley lived, did his work and died."

Prior to the time of Joseph Priestley mankind suffered tremendous pain in surgical operations. The French surgeon Paré, during the middle of the sixteenth century, when operating anesthetized his patients with the wines of France and frequently augmented the narcosis with a sharp blow on the head with a mallet, and frequently he conferred permanent anesthesia on many of his unsuspecting patients.

In the year 1809, the same year Abraham Lincoln was born, Mrs. Jane Crawford of Danville, Kentucky made that momentous trip on horseback over the mountains to the office of Dr. Ephraim McDowell and there without anesthesia, without antiseptics, he removed a 22 pound tumor. The distinguished ovariologist heard Mrs. Crawford say as she visited his office in 1809, "Doctor, proceed with the operation. I have faith in your judgment and skill." She was then 48 years old and lived to see her 72nd birthday. Her remains lie now in a graveyard in a small Indiana town.

Joseph Priestley had no idea that nitrous oxide would be useful in the alleviation of human pain and suffering. In the year 1800, at the turn of the century, Sir Humphrey Davy remade Priestley's gas and in a letter to one of his friends Davy wrote as follows: "I remade this gas that Joseph Priestley discovered, inhaled it, and my pulse jumped 20 strokes. I danced around my laboratory like a mad man." He suggested to the medical profession that in all probability this substance might be useful in the alleviation of pain produced by surgery, but a skeptical profession frowned upon the suggestion while men continued to suffer. Davy persisted. He was called on by Count Rumford, the founder of the Royal Institution of London, the Prime Minister, and Mr. Wedgewood, who were all anesthetized with laughing gas, and yet they did not conceive of the application of this wonderful boon to humanity as it might have been used in your profession and in the profession of medicine.

The scene shifts now across the Atlantic from England into this country. Four decades have passed and the year is 1844. The exact date is December 10th and in Hartford, Connecticut a ripple of enthusiasm stirs throughout the town. A miracle worker is coming to town. He is Gardner Q. Colton, lecturer on chemical phenomena. He has a new gas and this new



gas can make people act beside themselves. It can make a very peaceable man pugnacious. It can throw him into fits of anger. And that afternoon a dentist of Hartford, Connecticut had flash through his scintillating intellect the idea of the possibility of using this gas in dentistry. That evening he took Mrs. Wells to hear Dr. Colton. Reluctantly she went. They occupied positions up in the front row. It was advertised that the front row would be occupied by strong men so that if any of these people who were put under the influence of laughing gas would tend to work harm on the audience, the nine men on the front row would take care of them. Time went on. The performance started. A young man, a clerk in a drug store, whose name was Cooley, was called to the stage and then the black silk bag was squeezed and Gardner Colton allowed Mr. Cooley to inhale Priestley's gas. Cooley became greatly exhilarated. He jumped off the platform, darted down through the benches in the audience, hit his shin a dreadful blow against one of the oaken benches and madly ran out all through the auditorium, and then slumped down. Horace Wells followed him closely. He looked at his legs. He saw an ugly bruise and blood exuding. He inquired, "Cooley, did you feel pain?" Cooley said, "I didn't know it happened."

Then Wells continued to ponder in his mind. That evening a little snow fell in Hartford. Mrs. Wells gently chided Dr. Wells. "Why did you take me out to such a performance as that? It would have been better to spend our time beside the fire in our own home." All night Wells did not sleep. The next day he communicated with Dr. Colton and with a friend, Dr. Riggs, and Mr. Cooley went to his dental office and there Dr. Riggs extracted one of the teeth of Horace Wells while Wells squeezed Dr. Colton's bag. Wells did not whimper. The era of painless dentistry had been established and man had acquired a surcease of pain.

Time went on and Wells did not succeed in getting the use of nitrous oxide well established in his native town of Hartford. Owing to ill health he gave up his dental practice. He was then associated with Dr. William T. G. Morton. Wells went into the business of giving entertainments on natural phenomena and taking shower baths in order to recuperate his health. However, he could not get from his mind this fundamental concept that when man is in anger, in passion, in rage, or in a period of exuberance or exultation, he does not feel pain. Further, if by chemical agents such as chloroform, ether, or nitrous oxide one can produce similar psychic states, one could relieve pain. And that was the fundamental idea underlying anesthesia. It was the centerpiece and everything else was embroidery around it.

Wells had quite abandoned his researches in the field of general anesthesia when a letter came to him from Dr. Morton, who had gone down to Boston

to attempt to patent a liquid by the name of "ether" which he was using in the alleviation of pain. Wells became interested. He traveled rapidly to Boston. There he tried to apply nitrous oxide again in the extraction of a tooth from a dental student of Harvard University. The student cried out, "I felt the pain!" and they hissed Wells out of the room as a charlatan and a mountebank. The difficulty with Wells at that time was that he had not mastered the technic of regulating the dose of nitrous oxide.

Off to Paris, and in the salons of Paris, Wells showed many times that nitrous oxide could alleviate pain. Abroad Wells received more recognition than he had received in this country. In 1848 he returned to this country to set up a dental practice in the City of New York, under the slogan of "painless dentistry, extraction of teeth without pain." Early in that new practice in New York he began to experiment on himself, this time using chloroform to alleviate pain.

While he was experimenting with chloroform Wells got into bad company. He was called out on the street one evening and along with an evil companion they were accused of pouring vitriol on women of ill repute in the City of New York. Wells was arrested, imprisoned in the Tombs in January, 1848, at the age of 33. Sunday morning, having been in prison only a few days, Wells attended a church service, apparently in good spirits. The next day the keeper of the prison found him dead. He had taken a knife and severed one of his femoral arteries while he inhaled chloroform to alleviate the pain, and so he died never realizing what a great boon he had given to all humanity.

As Wells passed, the spirit of Wells marched on through the decades. Down in Georgia, Crawford W. Long, a physician, in 1841 heard of a liquid that was being used to cause people great exhilaration comparable to alcoholic inebriety and the young physician got interested. There in Jefferson County he invited many people into his home and he used ether for inhalation purposes. These people would become exhilarated—ether frolics were born and they became very popular. It happened one day a colored boy looking in the window was snatched in and given a great amount of ether. He went deep down into surgical anesthesia and they were very much afraid they would be unable to awaken him. When he came to, through the mind of Crawford W. Long flashed the possibility of using ether as an agent to relieve pain. The people in Georgia, particularly the medical profession, were skeptical about these ether frolics and as a matter of fact they had every right to be, for in these early days of ether frolics young women were invited into the frolics. As they engaged in this ether inebriety very frequently they were caressed by men whose caresses they did not invite. It was Caroline Swain who was brought in one day and engaged in an ether frolic that Crawford W. Long himself was operating and Caroline Swain later became Mrs. Crawford W. Long.

Time went on and Crawford W. Long was warned by the people in Georgia to stop using this substance. He was dissuaded from going on with his experiments even though he had used ether to remove a cyst from the neck of Mr. James Venable and Mr. Venable apparently felt no pain.

Out of the South the scene of general anesthesia pushed north and now it goes from the hands of a physician again into the hands of a dentist as we look in at the work of Dr. Morton, associate of Dr. Wells. In Boston, Morton had come in contact with a chemist whose name was Jackson. Jackson had anesthetized himself many times with diethyl ether and he informed Morton that ether was not particularly harmful, that one could take it—could inhale it, go under narcosis and awaken again apparently with impunity. And so Morton saw the possibility of using this substance in surgery. In Boston he persuaded the surgeon, Dr. John C. Warren, the grandson of the famous Dr. Warren associated with General Putnam of the Battle of Bunker Hill, to permit him to use ether on one of his patients. The year is 1846. The date is October 16th, and the group in the operating room that morning is skeptical. They have always been skeptical. Morton was busy at the shop of Mr. Chamberlin who was making the mask for him. Chamberlin had promised to have the mask ready at 9:30 and it was already ten o'clock. In the operating room there were sneers and snickers, and someone declared, "Another miracle worker whose miracle will not work out." Even Dr. Warren wondered if Dr. Morton would appear. Breathlessly he entered the operating room as the group in the balcony in their long frocktail coats waited to see what would happen. Then carefully with his new mask Morton began to drop diethyl ether slowly, slowly, and then came that statement—that memorable statement—that has echoed down through the decades, when Dr. Morton looked up and said to Dr. Warren, "Dr. Warren, your patient is now ready." Dr. Warren looked down at the table and turning to the skeptics in the audience said, "Gentlemen, this is no humbug. Mr. Abbott is fast asleep."

At that time, as you well know, there arose quite a controversy with Crawford W. Long, who read this account in the Georgia paper in the year 1846, as to who should have priority for the discovery of ether. This controversy reached the astute mind of Oliver Wendell Holmes, and Holmes with his usual sagacity said: "Gentlemen, when you die—and you both will die—we shall put on your tombstones 'To Ether' and we shall spell it either and we shall put parentheses around the 'i' so one who passes may read, 'To Ether' or 'To Either'." And that is how Holmes decided to settle the controversy.

I must tell you of the letter that Holmes wrote to Morton about six months after ether day in Boston. He said: "Dr. Morton, I have given great consideration to this agent which you have used in Boston and have selected



for it a generic term, for I believe it will be on the tongue of every person who is to live anywhere on this planet. I have called it "anaesthesia—want of feeling." "Without perception" the name anesthesia was born when Oliver Wendell Holmes assigned that name to the liquid which Morton used in the City of Boston.

Not to be outdone by the young republic on this side of the Atlantic, men in England began to look for substances as good as or better than diethyl ether. They had had the experiences of Henry Hickman, who preceded Wells, and many other people in this country in preliminary experiments on animals, and so today in celebrating the centenary of anesthesia we look in on the Professor of Midwifery in the University of Edinburgh, James Simpson. Simpson had tried out many different compounds. They did not work. They were not so good as ether or they were poisonous, so he discarded them. One day as he was fumbling through the papers on his desk he came across a vial of colorless volatile liquid sent him by the German apothecary, Justus Von Liebig. He thought "Oh, I have tried everything else. I might just as well try this chloroform which Liebig has suggested." So he anesthetized himself to unconsciousness and then his associates, Keith and Duncan, apparently with impunity, and it was Simpson who suggested, "We may now use this substance in childbirth"—the first twilight sleep. At once the clergy arose and said, "Simpson, this is unbiblical and should not be allowed, for the Bible says that in pain women shall bring forth their young and anything that is contrary to that concept is unworthy of us or irreligious and certainly should not be permitted." But listen to James Simpson. He was a brilliant scientist and he was also astute at repartee. "Gentlemen, if you wish to get biblical about this matter, go back far enough in the Bible. In the Book of Genesis we read 'When God created Eve from the rib of Adam, he caused Adam to fall into a deep sleep.' So God himself administered the first general anesthetic. The scripture says so."

It was, however, not until Victoria, who in England was more than a queen—she was an English institution—permitted chloroform to be used on her at the birth of her seventh son, Prince Leopold, that the voice of prejudice disappeared and chloroform took its rightful place among the general anesthetics. It was Victoria who knighted James Simpson for this great discovery. He then became Sir James and it is told that on his shield was engraved a small baby, owing to the fact that chloroform was being used in the production of twilight sleep; and then the armor plate worker looking for a fitting caption to engrave on the shield thought of this very trenchant remark, "Does your mother know you're out?"

There were nine barren decades in the field of general anesthesia and at the turn of the century one had Wells' nitrous oxide, Morton's ether, and



Simpson's chloroform, mind you, all three of them based upon the fundamental concept of Horace Wells. In the year 1922 Arno B. Luckhardt, of the University of Chicago, made the casual observation that when pink carnations were brought in from the Wisconsin fields and remained for some time in Chicago they bleached out in the atmosphere of that municipality, and he wondered why. Why do carnations bleach out?

In speaking of Luckhardt's wondering about why carnations bleach out, it gives me the opportunity to give you the definition—the best one I have ever heard, describing a scientist.

A scientist is one who has the simplicity to wonder, the ability to question, the power to generalize, the capacity to apply.

He wondered about pink carnations. He made an analysis of the air and found there were traces of ethylene in the air of that city. That was the cause of the carnations' bleaching. Now, if this ethylene so affects plant protoplasm, what effect does it have upon animal protoplasm? So he tested ethylene on frogs, on cats, on dogs, on monkeys, and ultimately anesthetized himself several times to unconsciousness. In 1922 ethylene was added to the list of general anesthetics. Ethylene has an outstanding disadvantage. It must be given in very high concentrations—90 per cent along with 10 per cent of oxygen—and the mixture is extraordinarily explosive. The explosions have a catastrophic nature of going down in the bronchial tree of the individual and generally eviscerating him.

Time went on and in 1927 there was introduced into this country, coming out of the German laboratories, the compound known as avertin—tribromomethanol. We sometimes hold the view, erroneously so, that avertin owes its anesthetic action to the fact it has bromine in the molecule. As a matter of fact, it is simply an ethyl alcohol of heavy molecular weight that penetrates deep in the lipoids of the central nervous system and by this deep penetration brings about narcosis. Avertin is administered rectally as an anesthetic. Its anesthetic dose and its toxic dose are close to one another, therefore the careful anesthetist today, when he wishes to use avertin, as a rule, uses about two-thirds of the anesthetic dose and augments the anesthesia with nitrous oxide or diethyl ether.

Statistics on deaths of those people who have died under avertin anesthesia show that one in 2500 die, which is equal to the number of deaths that occur under chloroform anesthesia. Against that we have one in 12,000 with ethyl ether, and one in 1,000,000 with Horace Wells' nitrous oxide.

In the year 1930 it occurred to the fertile mind of Chauncey Leake, now of the University of Texas, that it might be a prudent idea to combine ethylene, which is characterized by such a smooth induction, with ethyl ether, which is characterized by good and long abdominal relaxation. The compound, the cross between the two, the hybrid molecule

might have advantages, and so the compound was prepared divinyl oxide—vinethene as you know it today. Vinethene is useful in dental practice owing to the rapidity of induction. Its potency is about four times that of diethyl ether and it is recommended for operations of short duration.

In the year 1932, in that laboratory of the University of Toronto adjacent to the place where Banting and Best discovered insulin, Lucas and Henderson, in looking for a better ethylene, succeeded in making cyclopropane and using it as a general anesthetic. This anesthetic gas will give deep surgical anesthesia in concentrations of 15 per cent against 90 per cent with nitrous oxide or 80 or 90 per cent of ethylene. Under cyclopropane anesthesia the patient is better oxygenated and has less postoperative sequellae, and at the same time less liver damage. Is this the answer? Is it the best anesthetic for which we have been striving? No, under cyclopropane, particularly, the hypersensitive individual will show extra ventricular systoles. Besides, the explosibility of ethylene and oxygen holds with equal force with the gas mixture of cyclopropane and oxygen.

In the year 1937 it occurred to us at the University of Maryland Medical School that it might be a matter of prudence to unite if possible the molecules of cyclopropane and diethyl ether. Cyclopropane has its advantages. The advantages of ether are well established. After a series of experiments lasting over a period of more than six years, we succeeded in producing separate and distinct anesthetic agents which in their general chemical structure may be considered to be a hybrid of molecules between ethyl ether and cyclopropane. The first of these was cyprome ether, not sufficiently better than ethyl ether to warrant any special merit. Then came cypreth ether. Cypreth was promising on rhesus macacus monkeys but its vapors were irrespirable by man. One could not inhale its vapors. Then by a series of chemical reactions we succeeded in making what the late Dr. Karl Connell called trinity ether, because in one molecule there was cyclopropane, ethylene, and diethyl ether. We called it cyprethylene ether. We had great hopes for this compound, but there apparently was no satisfactory method of preparing it other than at a cost which made its use prohibitive.

In our experiences in preparing cyprethylene ether we succeeded in making a compound which the chemist would call an isomer—i.e., it contains the same atoms, the same number of atoms but arranged differently in space. This compound was not difficult to prepare and after a year's experimental work—having tried it more than 150 times on frogs, guinea pigs, rats, dogs, and rhesus macacus monkeys, on June 30, 1943, I invited Constance Black, a skilled anesthetist of Baltimore, into my laboratory to anesthetize me with propethylene. She had previously used cyprome ether. That morning she was reluctant to do it.

"Not at all," she said. "I will not proceed to anesthetize you with it, but I have come here to have you anesthetize me with propethylenes." I was no more eager to anesthetize her than she was to anesthetize me, but, after all, if she was willing, I could not graciously refuse. So, she lay down on the table. The oxygen and carbon dioxide and adrenalin were all very, very handy and at 11:30 o'clock I began to drop propethylenes on a home-made mask and Mrs. Black began to count. Forty-five seconds later she lost consciousness and remained under the anesthesia for a period of more than five minutes. I must confess that the most pleasant sound that I have heard on this planet was when Mrs. Black responded to the call of her name, coming to from the first propethylenes anesthesia.

Since that time propethylenes has been used hundreds of times. Its potency is about four times greater than that of ethyl ether, its concentration in the blood 25 mg. per cent under deep surgical anesthesia in contrast to 150 mg. per cent with diethyl ether. In it we believe we have developed a new principle in general anesthesia. Other volatile anesthetic agents enter and leave the body unchanged. Propethylenes is partially broken down in the human body into acetone and acetic aldehyde, each substance being less toxic than propethylenes itself. It is interesting after a two hour anesthesia, as the patient is being lifted to the surgical carriage, to see him open his eyes and regain complete consciousness. The boiling point of propethylenes ether is 55° C. compared with 36° C. for ethyl ether, which makes it available in tropical countries where ether is difficult to administer.

We do not know—only time will tell—whether in this centenary year of anesthesia we have added another useful anesthetic agent to the armamentarium of the anesthetist.

Many years ago the youthful general, Napoleon Bonaparte, stood on the sands of Egypt before the pyramids and addressed his soldiers saying, "Forty centuries are looking down on you." This afternoon, as you sit here, ten decades of anesthesia are looking down on you and I believe somewhere behind the infinite azure of the morning cloud Horace Wells is looking down on us and he is saying in immortal tones, "It was I who was called to fulfill the scripture's prophecy 'Neither shall there be any more pain.'"

## A COMPARATIVE STUDY OF PERINEAL AND SUPRAPUBIC PROSTATECTOMIES AT THE BALTIMORE CITY HOSPITALS\*†

ROSS Z. PIERPONT, M.D., IOWA CITY, IOWA AND  
DONALD B. HEBB, M.D., BALTIMORE, MD.

This presentation is made to help in some measure to dispel the prevailing impression that perineal prostatectomy is a formidable procedure except in the hands of persons with specialized training in this field. It does not "require a trained surgical team" and need not "always remain an expert's operation" (1, 2, 5).

In the Baltimore City Hospitals the suprapubic prostatectomy has been for years the routine operative procedure on the prostate gland, with an occasional transurethral and a rare perineal operation being done. This has been felt to be the safest procedure since about 98 per cent of the work here is handled by the house staff under supervision. It was decided by the visiting staff in September, 1942 that the house officers might do a series of perineal prostatectomies. At first only patients who were poor risks were operated on, but the results were so gratifying that the perineal operation is now being used with great success. It should be borne in mind, however, that most of these patients with prostatic disease are poor risks, since they are derived from the indigent of the city who have been treated unsuccessfully and many have been in retention for days before admission.

To date twenty perineal operations have been done, all performed by the resident or assistant residents after thorough surgical training. The results in these twenty cases are compared with twenty consecutive cases of suprapubic prostatectomy done by the authors or by previous residents.

The perineal operative procedure used was the one reported so precisely and excellently by Dr. Hugh H. Young (8). Nearly all of the special instruments described by Dr. Young for use in this procedure were available except the boomerang needle. Instead of this, the Mayo needle holder and a small, round, curved needle were used for suturing. A 75 cc. Foley bag was used for hemostatic purposes and drawn out through the perineum. A Penrose drain was used for routine drainage of the perineum.

The ages of the two groups are compared in Table I. The average age of the patients who had perineal prostatectomies was sixty-eight years, and

\*From the Department of Urology, Baltimore City Hospitals under the Direction of Dr. W. H. Toulson, Professor of Genito-Urinary Surgery, School of Medicine, University of Maryland.

†Received for publication June 23, 1944.



those on whom suprapubic prostatectomies were done averaged sixty-nine years.

The average number of days required for perineal wound closure was 19.1 in eighteen patients and for suprapubic closure 29.4 in sixteen patients (Table II). This compares favorably with a series reported in 1941 by Vest (7). Two patients are excluded from the group on whom the perineal operative procedure was followed. In one patient, H. W., Case No. 16,213, a vesicorectoperineal fistula with no healing developed. This was the result of entrance into the rectum at the stage of the operation where this complication is likely to occur, that is, at the point where the posterior layer of

TABLE I

YEARS	PERINEAL OPERATIVE PROCEDURE	SUPRAPUBIC PROSTATECTOMY
40 to 50	1	
50 to 60	1	4
60 to 70	8	6
70 to 80	9	8
80 to 90	1	2
Average Age.....	68	69

TABLE II

	AVERAGE TIME OF WOUND CLOSURE	AVERAGE POSTOPERATIVE HOSPITAL STAY	MORTALITY RATE
	<i>days</i>		<i>per cent</i>
Perineal prostatectomy.....	19.1	36	10
Suprapubic prostatectomy.....	29.4	37	20

Denonvilliers' fascia is exposed. The patient presented himself early in the series and the prostatectomy was inadvisedly continued after the rectum was entered. In the second patient, A. G., Case No. 84,842, the rectum was entered at the operation; however, the perineum was closed without the prostatectomy being done. This wound healed in eight days and a suprapubic prostatectomy was done at a later date with good results.

Four cases of suprapubic prostatectomy are excluded in the group comparing the average healing time. W. K., Case No. 81,068, was discharged from the hospital on his forty-fourth postoperative day. One month later he was readmitted to the medical service with pneumonia, at which time an abdominal fistula was still present. C. K., Case No. 76,032, and H. M., Case No. 75,602, who died on the tenth and eighteenth postoperative days

respectively, were unhealed. F. R., Case No. 76,733, had a complicating carcinoma of the bladder and died unhealed on the thirty-eighth postoperative day.

The average length of the postoperative hospital stay was thirty-six days for those on whom perineal operative procedures were carried out and thirty-seven days for the group who had suprapubic prostatectomies (Table II). This lengthy postoperative hospital course is somewhat misleading in both groups since in the Baltimore City Hospitals the patients at discharge must be able to walk about all day and completely care for themselves, thus necessitating longer periods of residence at the hospital than is usually the case.

The amount of discharge from the wounds has been less in the perineal prostatectomies, though practically all of the perineal wounds became infected. This was probably caused by the lack of ward personnel. There have been no persistent perineal fistulas, except for the one case mentioned. The postoperative care of this group has been much easier than that of the patients on whom suprapubic prostatectomies were done. The absence of operative shock and postoperative bleeding has been particularly noteworthy. There were four cases of postoperative hemorrhage in the suprapubic group and none in the perineal operative procedures.

On discharge two patients who had perineal prostatectomies had occasional nocturnal dribbling. This symptom developed in only one suprapubic prostatectomy.

There were two deaths in the perineal group. D. B., Case No. 80,661, eighty-four years old, died of uremia on the seventeenth postoperative day. The patient had preoperative uremia of sufficient gravity to necessitate a preoperative suprapubic drainage for over three months. The perineal route was selected because it was felt that this offered the best chance of survival. The other death occurred in W. B., Case No. 82,372, seventy-two years of age, who died of cerebral thrombosis and uremia twenty-nine days postoperatively. The perineal wounds of both patients were healed at the time of death.

There were four deaths in the group on whom suprapubic prostatectomies were done. C. K., Case No. 76,032, eighty-three years old, died of cardiac failure and bronchopneumonia on the eleventh postoperative day. H. M., Case No. 75,602, sixty-seven years of age, died on the eighteenth postoperative day of bronchopneumonia. F. B., Case No. 76,733, age sixty-nine, died on the thirty-eighth postoperative day from metastasizing carcinoma of the bladder. L. B., Case No. 80,000, died on the sixty-second postoperative day as a result of a periurethral abscess with cellulitis of the penis and scrotum, with secondary hemorrhage and uremia.

The mortality rates of 10 per cent in the first group and 20 per cent in the

second group are included in Table II. These rates compare favorably with those reported in other series of prostatectomies from charity hospitals (3, 4, 6).

#### SUMMARY

Twenty consecutive cases of perineal prostatectomy are compared with twenty consecutive cases of suprapubic prostatectomy from the Baltimore City Hospitals. All of the prostatectomies were handled by the house officers. The technic of the perineal operative procedure described by Dr. Hugh H. Young was used.

#### CONCLUSIONS

1. Perineal prostatectomies can be done satisfactorily by persons with good surgical training.
2. The mortality and morbidity are considerably less in the series of perineal prostatectomies than in the suprapubic prostatectomy group.
3. The postoperative care for the house officers and nursing staff is easier in perineal prostatectomies than in suprapubic prostatectomies.
4. An infected perineal wound does not necessarily indicate a subsequent fistula.

The authors are indebted to Dr. W. H. Toulson, Professor of Genito-Urinary Surgery, School of Medicine, University of Maryland, and Dr. Hugh J. Jewett, Associate in Urology, Johns Hopkins Hospital and Assisting Visiting Urologist, Baltimore City Hospitals, for their encouragement and advice in the preparation of this manuscript.

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# AN OBSTETRIC CASE HISTORY\*†

## INTRODUCTION

Arrangements have been made with the Department of Obstetrics to publish in each issue of THE BULLETIN a case from its files. First, the case will be presented in all of its essential details and the question will be asked as to how it should be treated. Following this will be a discussion giving the actual treatment and the reasons therefor, with the results.

## CASE REPORT

*Case No. 1:* The patient was a primigravida, twenty years old. The family, past, and menstrual histories were negative. The date of the last menstruation was October 3; estimated date of confinement was July 10.

Labor pains began on July 8 at 7:00 A.M.; the membranes ruptured the same day at 6:00 P.M. She was first seen at 10:00 P.M. At that time the pains were regular and strong, about three minutes apart, and bearing down in type. The diagnosis by palpation was right occiput posterior. The head was engaged in high midpelvis. The fetal heart rate, right lower quadrant, was 140. Pelvic measurements in centimeters were: spines 25; crests 27; trochanters 31; Baudelocque's diameter 19.5; outlet intertuberosity 9.5; posterior sagittal 8. A rectal examination confirmed the diagnosis made and showed the membranes to be ruptured and the cervix fully dilated and retracted. At 4:30 P.M. no definite descent of the head could be noted; the diagnosis then was right occiput transverse; the fetal heart rate was 148. The mother's temperature was 99 F., her pulse rate was 88, and respirations were 24 per minute. She complained of being worn out and exhausted and pleaded for interference. The pains were about the same as at 10:00 P.M.

### *Treatment:*

It is suggested that the reader answer the question of treatment before reading the discussion.

## DISCUSSION

It would appear that in this case the second stage of labor lasted five and a half hours and that the head descended only slightly during that time. However, it cannot be said that there was no progress at all for rotation was occurring and the position of the head had changed from right occiput posterior to right occiput transverse. It could be reasonably expected that when anterior rotation was completed the descent would be rather rapid and without incident. The condition of both the mother and the baby appeared to be good and there was no indication for interference at that time. The statement of the patient that she was exhausted was not borne out by her pulse rate and certainly did not constitute an indication. Since normal delivery was expected in this case it was thought advisable to wait. The patient was watched for evidence of exhaustion and given sedation, but no other treatment appeared to be indicated.

*Actual treatment:* Sedation with paraldehyde.

*Result:* Delivery with outlet forceps was made of a living child in good condition at 12:50 A.M.

*Diagnosis:* Right occiput anterior.

\* From the Department of Obstetrics, School of Medicine, University of Maryland.

† Received for publication September 5, 1944.



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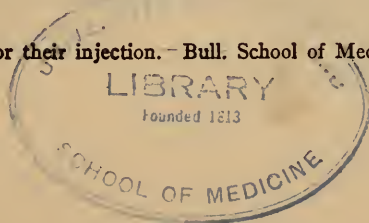
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The names listed above are officers for the term beginning July 1, 1943 and ending June 30, 1945

## NEWS FROM THOSE IN THE ARMED FORCES

### PROMOTIONS

Lieut. Col. Walter D. Wise, P. & S., Class of 1906, has been promoted to the rank of colonel.

Colonel Wise was formerly Professor of Surgery and a member of the Board of Editors of The Bulletin. He was surgeon-in-chief at Mercy Hospital and chairman of the board of governors and executive committee of that hospital, also visiting surgeon at Union Memorial and South Baltimore General hospitals and the Hospital for the Women of Maryland.

In 1943 Colonel Wise was president of the Baltimore City Medical Society, president of the Medical Alumni Association of the University of Maryland in 1942, and secretary of the Medical and Chirurgical Faculty of Maryland from 1932 to 1939.

Entering the Army in April, 1942 he served as medical director of Selective Service for Maryland before being assigned as surgical consultant for Third Service Command hospitals.

Colonel Wise is a member of the Founders' Group of the American Board of Surgery, the American Medical Association, American Surgical Association, Southern Surgical Association, American College of Surgeons, American Association for Surgery of Trauma, and the Association of Military Surgeons of the United States.

Other promotions include:



*To rank of Lieutenant Commander:*

Herbert Berger, Class of 1932, now serving as senior medical officer aboard the U. S. S. General Wm. M. Black in the European theater.

*To rank of Captain:*

Morton L. Hamburger, Class of 1942.

## CITATIONS

## SILVER STAR

Capt. Nathaniel M. Sperling, Class of 1930, has been awarded the Silver Star for meritorious action while serving as battalion surgeon with his unit in the Normandy invasion on D-2.

## THE LEGION OF MERIT

For outstanding heroism and professional skill in saving the lives of a number of officers and men who were adrift for three days in the Pacific after their ship had been sunk by the enemy, Lieut. Com. John Z. Bowers, M.C., U. S. N. R., Class of 1938, has been awarded the Legion of Merit by Admiral C. W. Nimitz. The award was presented at the Naval Hospital, Quantico Marine Barracks, by Maj. Gen. P. H. Torrey, commandant of the post.

The citation states that loss of life among the ten officers and sixty-five men was relatively small because of the "professional skill and ceaseless attention" of Commander Bowers. For fourteen hours he remained in the water, swimming between rafts and applying dressings to wounds as best he could with the meager facilities at hand. In addition to carrying out his duties as a medical officer he kept up the morale and spirits of the survivors.

Commander Bowers also recently received the decoration of the Purple Heart.

Lieut. Col. Monte Edwards has been made chief of the surgical service at La Garde General Hospital, New Orleans, La.

Colonel Edwards received his medical degree at St. Thomas' Hospital Medical School, London, England, in 1917 and completed his internship at the same place. He served in World War I in France, was commissioned in 1917 in the Medical Corps of the British Army. He received various other appointments in England after the war.

In 1923 Colonel Edwards came to the United States to further his studies at the University of Maryland, where he was appointed to the teaching staff until his entry into the Army in January, 1941. He was placed on



LIEUT. COL. MONTE EDWARDS

active duty in April, 1942 and served in the Fiji Islands until his appointment as chief of surgical service of the 142nd General Hospital, where he served until December of the same year. He then was assigned to serve in a similar capacity at the Station Hospital, Camp Gruber, Oklahoma, to which hospital he has been attached since April, 1943.

Lieut. Col. Samuel E. Proctor, Class of 1932, has been appointed post surgeon at Holabird Signal Depot, Baltimore.

Colonel Proctor practiced general surgery in Baltimore previous to active duty with the Army, and prior to this was associated with the Departments of Clinical Surgery and Surgical Anatomy at the School of Medicine, University of Maryland. He entered active service with the Army in March, 1941.

Stationed at Fort Belvoir, Va. and active in the establishment of the surgical department, Colonel Proctor was assistant chief of surgical service in the station hospital. After sixteen months' duty at Fort Belvoir he was transferred to Camp Pickett, Va. to open a new surgical department. Later transferred to Camp Reynolds, Pa. he established the surgical department in the new station hospital and remained at this post as chief of surgical service. Colonel Proctor is a fellow of the American College of Surgeons. Several articles written by him recently have been published in medical journals.

While doctoring a wounded soldier on the Normandy beachhead in the wake of the first invasion of France on June 6, Capt. Joseph E. Muse, Jr., Class of 1937, was fired upon by a German sniper and seriously wounded. He is now in a hospital in England.

Before entering active service two years ago Captain Muse was a resident physician at St. Agnes Hospital, served on the staff of the University Hospital, and practiced in Baltimore. He had been in England for five months.

Com. F. A. Holden, Class of 1920, a flight surgeon, is senior medical officer on the Aircraft Carrier U.S.S. Tulagi.

Capt. Thompson Percy, Class of 1941, is with the 13th General Hospital in New Guinea.

Capt. Benjamin Bardfeld, Class of 1929, is stationed at the 141st General Hospital in the European Theater of Operations.

Capt. Leonard L. Heimoff, Class of 1939, is venereal disease control officer at Station Hospital, Indiantown Gap Mil. Res., Pa.

Lieut. Gibson J. Wells, M.C., U. S. N. R., Class of 1936, recently was transferred to duty outside the continental limits in an amphibious activity. He had been stationed for two years in Norfolk, Virginia as medical officer-in-charge of a pediatrics clinic. Lieutenant Wells was formerly Instructor in Pediatrics, and is a licentiate of the American Board of Pediatrics.

Lieut. (j.g.) Robert A. Moses, M.C., U.S.N.R., Class of 1942, has recently returned after serving in the European theater and is now stationed at the Naval Air Hospital, Pensacola, Fla.

Among those recently called to active duty with the rank of first lieutenant were:

Henry A. Briele, Class of 1939

William Harvey Leitch, Class of 1939

Schuyler George Kohn, Class of 1940

Edward Louis Krieg, Class of 1940

William Joseph Supik, Class of 1940

Somewhere in the South Pacific

Dear Friends:

Much has transpired since my last note. First of all, here we are in New Guinea; secondly, I am still the surgeon of the training center; thirdly, I've also been made commanding officer of this station hospital; also, we are busy rushing construction of our hospital; furthermore, we are organizing schools to train medical technicians of many categories from our newly organized rehabilitation groups; and finally, the step-up in grade.

We have quite an ideal spot on the seashore, with the old Pacific lapping practically at our doors. As soon as sufficient jungle is cleared the patients may sit in their wards and see the ocean. The nurses' quarters are about 150 yards away and the officers' about 100 yards from the beach. It should be ideal. The weather is not at all bad, during this time of the year at least. The temperature is high during the middle of the day but always cools off at night. Very little exertion causes considerable perspiration. Rain has been scarce, consequently dust is about two or more inches thick, requiring lights on vehicles during the day.

Brought 200 hens and about fifteen roosters when we came. Outside of five casualties during the voyage, they are all enjoying good health and are quite productive, according to the report from the veterinarian. We also plan to have a vegetable and flower garden, having procured ample seed, a plough, and two sections of a spring tooth barrow prior to leaving the mainland.

The island itself is not at all bad, though in actual combat where it is necessary to plough through the jungles and high kunae grass I am confident it necessitates real stamina and hardship. The palms of all descriptions and cocoanut trees are quite pretty, not to mention the wild orchids which grow rather profusely. The birds are all of beautiful plumage and though their calls are not particularly musical they are interesting.

The natives are a peculiar lot, ever so inquisitive but rather sensitive



about exposing certain parts of the body. The male dress is usually just a piece of material similar to our blue denim wrapped around their waist,—they call it a lap lap. The hair is quite kinky and fuzzy, the outer hair being bleached in most instances to a brickish red. The teeth are pretty well worn and black from chewing the betel nut, from which they apparently derive a stimulating or sedative effect. Can't say which because I can't find one who has tried it. Their features are rather coarse.

Wild animals are chiefly the boar, which is rather scarce, and a few wallabies (kin to kangaroo).

The natives are quite apt at growing vegetables, which in conjunction with wild fruit furnishes their main diet, with an occasional wild boar or one of our mongrel dogs which they may coax away. Have seen only one native female so far and she wore the same type of dress only a little longer, but with nothing covering the upper part of the trunk. This one was accompanying several men, all of whom were empty handed, whereas she had a large woven vine affair like a rope net swung from her forehead over the back loaded with canned food probably found on the beach, as many wash up at times.

They are exceedingly apt at gigging fish, and I understand fix it in a very enticing way. It is first cleaned and then rolled in a banana leaf and slowly baked over an open fire.

The natives are interesting and I must arrange to observe them a little more on details as to habits and modes of living. They are quite friendly.

Flies are overabundant, mosquitoes few and far between but pretty heavily laden with parasites. Thank goodness atabrine, repellent, spray, leggings, and mosquito nets are plentiful.

Have not visited any of the recent battlefields near this site as yet but hope to do so the first time an opportunity presents itself. Hope to get a few pictures.

Swimming or rather surf bathing is almost a daily habit, should really say a necessity, for one needs it to boost one up for the early afternoon.

News is encouraging and we are all hoping for a complete victory early in '45.

Sincerely,  
Kennedy  
(Lieut. Col. W. K. Waller)

#### ITEMS

Dr. Thomas S. Saunders, Class of 1932, has been promoted from Clinical Associate to Assistant Professor in Dermatology and Syphilology at the University of Oregon Medical School.

## OBITUARIES

### CAPT. JOHN E. FISSEL

Capt. John E. Fissel, Class of 1936, was killed on August 27, 1944 in Scotland during a flight from New York. He was a flight surgeon with a medical air evacuation transport squadron and was on his third flight from New York to Scotland when he lost his life.

Captain Fissel entered the Army in September, 1942 and received his wings at Randolph Field, Texas in April, 1943. He was on duty at Louisville, Ky. before entering overseas service.

### CAPT. BERNARD JOSEPH SABATINO

Captain Bernard Joseph Sabatino, Class of 1938, was killed during the landings in Normandy on D-day, June 6, 1944.

A graduate of Forest Park High School, Captain Sabatino took his premedical course at Johns Hopkins University. At the time of his enlistment in the Army Medical Corps in 1940 he was assistant resident in surgery at St. Joseph's Hospital. On April 18, 1944 he was married to Miss Psyche Mary Sittock of Devon, England. Captain Sabatino was a field hospital surgeon with the 29th Division and lost his life while serving in that capacity.

### WIRT ADAMS DUVALL, M.D.

Dr. Wirt Adams Duvall, former chief surgeon of the State Police Department and a member of the State Board of Education, died on June 17, 1944 at his home in Baltimore after an illness of several months.

After graduating from St. John's College, Annapolis in 1885 he entered the School of Medicine of the University of Maryland and received the degree of doctor of medicine in 1888. He was president of his class. For fifty years he practiced medicine in Baltimore and retired several years ago.

### CHARLES J. LASERTE, M.D.

Dr. Charles J. Laserte, B.M.C., Class of 1905, died suddenly on April 14, 1944 while calling on a patient. His death was caused by coronary thrombosis.

Born in Leominster, Mass., Dr. Laserte studied at the New York Post-graduate School after receiving his degree of doctor of medicine and also attended Harvard Medical School, the University of Illinois, and the Mayo Clinic. He was chief of the medical staff at the Leominster Hospital and a member of the American Medical Association, the Massachusetts Medical Association, and the Worcester North Medical Association.

**P. F. MARTIN, M.D.**

Dr. Patrick F. Martin, Class of 1900, died on June 24, 1944 at the age of sixty-seven. For the last twenty-two years he had been resident physician at Mt. St. Mary's College, Emmitsburg, and his death occurred in the college infirmary.

Dr. Martin served as coroner in the eastern and western districts of Baltimore for a number of years. He was a member of the medical examining board at the Mt. Hope retreat for many years and belonged to several fraternal organizations.

**H. D. WALKER, M.D.**

Dr. H. D. Walker, Class of 1902, died on July 7, 1944 of apoplexy. He had been taken from his home in Elizabeth City, N. C. to the Norfolk General Hospital, where he passed away several days later.

After graduation he served his internship at the University Hospital. During his student days he was a member of Phi Sigma fraternity and was a happy-go-lucky, conscientious young man who did his work satisfactorily. He started to practice in Elizabeth City in 1903 and for more than forty years was a prominent physician and surgeon there.

For many years Dr. Walker served as health officer, acting surgeon of the U.S. Public Health Service since 1911, and surgeon for the Norfolk South Railroad for thirty years. He was a member of the North Carolina Medical Association for forty-two years, was treasurer for eight years, and served two terms as vice-president. He was also greatly interested in the Methodist Church in Elizabeth City and a member of several fraternal organizations.

**OBITUARIES**

**Blackwelder, Charles G.**, New Springfield, Ohio; class of 1895; aged 75; died, May 18, 1944, of cerebral sclerosis.

**Dowd, Michael Joseph**, Thompsonville, Conn.; B.M.C., class of 1901; aged 75; died, April 4, 1944, of prostatitis and acute cardiac failure.

**Edwards, Edwin M. Stanton**, Trinway, Ohio; B.M.C., class of 1898; aged 71; died, June 11, 1944, of pneumonia.

**Hall, George Orbin**, Murrys ville, Pa.; P. & S., class of 1904; aged 69; died, May 10, 1944, of coronary occlusion.

**Kelly, Vernon Francis**, Baltimore, Md.; class of 1904; aged 60; died, March 5, 1944, of coronary occlusion.

**Laserte, Charles John**, Leominster, Mass.; B.M.C., class of 1905; aged 63; died, April 14, 1944, of coronary thrombosis.

**Lilley, Walter E.**, Merced, Calif.; B.M.C., class of 1894; aged 75; died, March 30, 1944, of angina pectoris.

- Palmer, Henry Edwards**, Tallahassee, Fla.; class of 1892; aged 77; died, March 22, 1944, of Adams-Stokes syndrome.
- Plassnig, Edwin M.**, Baltimore, Md.; class of 1925; served during World War I; aged 47; died, June 6, 1944, of chronic glomerulonephritis.
- Preston, Benjamin Spottswood**, Charleston, W. Va.; P. & S., class of 1902; aged 70; died, April 19, 1944, of cerebral hemorrhage.
- Roeder, Samuel Theodore, Jr.**, Baltimore, Md.; class of 1891; aged 75; died, April 26, 1944, of chronic myocarditis, nephritis, and arteriosclerosis.
- Sencindiver, Elisha Lewis**, Martinsburg, W. Va.; class of 1891; aged 77; died, June 19, 1944, of coronary thrombosis.
- Slicer, J. B.**, Rising Sun, Md.; P. & S., class of 1884; aged 86; died, September 8, 1944, in the Union Hospital at Elkton.
- Smith, Robert Morton**, West Warwick, R. I.; P. & S., class of 1889; served during World War I; aged 80; died, July 10, 1944, of general arteriosclerosis and cerebral thrombosis.
- Swindell, Walter Lee**, Swanquarter, N. C.; B.M.C., class of 1908; aged 65; died, June 12, 1944, of heart disease.
- Thomas, Marion Russell**, Savannah, Ga.; class of 1902; aged 53; died, April 8, 1944, of carcinoma.
- Wells, Robert F.**, Manchester, Md.; B.M.C., class of 1892; aged 78; died, June 1, 1944, of peritonitis and gangrene of the cecum.
- Wiest, Charles A.**, Stover, Mo.; class of 1897; aged 70; died, April 20, 1944, of heart disease.



# BULLETIN

OF THE

## SCHOOL OF MEDICINE

UNIVERSITY OF MARYLAND

Vol. 29

JANUARY, 1945

No. 4

### RICKETTSIAL DISEASES\*†

LIEUT. JOSEPH G. BIRD, M.C., A.U.S.

A definition of rickettsial diseases, as a group, is necessarily broad and perhaps incomplete until future enlightenment answers many open questions concerning these world-encircling scourges. Rickettsias are widely distributed in insects of many varieties and those which are pathogenic cause, in man, diseases which are self limited febrile ones transmitted by arthropods. As a rule, they are characterized clinically by a rash, and pathologically by lesions of small blood vessels wherein the causative organisms often can be demonstrated.

Pathogenic Rickettsias are in some respects intermediate between bacteria and the small viruses. Most bacteria can be cultivated apart from living tissue and some on simple chemical compounds. Such bacteria have complex enzyme systems, whereas others require special foodstuffs and exacting chemical environment for propagation. Viruses and Rickettsias have even greater requirements and do not grow apart from living cells. Pinkerton (12) reports that Rickettsias do grow better when the host cell has a lowered metabolic activity, whereas some viruses grow more readily in healthy, actively metabolizing cells.

Rickettsias are demonstrable by special staining methods as small spheroid or elongated bodies, intracellular in the case of most pathogenic ones, and are clearly defined and discrete. They do not pass through bacterial filters, with the exception of so-called Q fever.

The history of rickettsial diseases and the enormous amount of work that has produced the present understanding of them constitute a fascinating chapter in medicine. It must include mention of the devastation of armies and civilian populations for centuries by one of the most formidable of all

\* From the Department of Medicine, School of Medicine, University of Maryland.

† Received for publication October 10, 1944.

epidemic diseases, typhus fever. This scourge is the one longest known to occidental peoples, but the revelation of its character came after the elucidation of a more recently recognized disease, Rocky Mountain spotted fever. The unfolding of the mysteries of these diseases step by step, in tedious experiments, is indeed interesting, but to trace even the more important steps would require time not permitted here. Failure to acclaim recognition for the leadership of American investigators in this field would be an injustice of no small magnitude.

The work of Howard Taylor Ricketts of the University of Chicago is the most outstanding of all contributions to the field. His untimely death from typhus fever in 1910 while studying that disease in Mexico was a great loss to the medical profession. In 1906 he had proved that Rocky Mountain spotted fever is transmitted to man by the wood tick, and in the following year he showed that the infectious agent is transmitted to the offspring of the female tick. It is known that mating spreads the agents among ticks. One year before his death Ricketts saw the organisms of spotted fever in the tissues of ticks and in the blood of human patients and infected animals. In 1910 he proved that Mexican typhus, also called tabardillo, is transmitted by the louse. He stained the organisms and proved by immunologic differences that this disease is distinct from spotted fever. Six years after his death his name was enshrined by da Rocha-Lima who created the genus *Rickettsia*. Ricketts' work set a pattern followed in studying the various diseases of the group in other continents, and many Americans have continued to lead the world in this field.

Wolbach (17), in the recent Harvard symposium, asserted that the importance of rickettsial diseases economically and as a menace to life is probably exceeded only by malaria.

The earliest occurrence of a disease which historians have assumed to be typhus was recorded about 1083 A.D. in a monastery near Salerno, Italy. In 1546 the first description of typhus was written by Fracastorius. Throughout the centuries since then typhus has been prevalent in repeated epidemics which often have determined the outcome of battles. It was of serious importance in the armies of Napoleon, in Serbia in World War I, and in Poland, Rumania, and Russia following that war. It has depended upon upheavals in hygienic living conditions of the masses, as in wartime or famine, for its epidemic proportions, and millions have died in some epidemics, as in Russia.

Between wars typhus is reduced to small outbreaks and sporadic cases. It has been increasing in Europe in the present war, but only once has it even threatened its usual epidemic course. This was in Naples during the winter of 1943-1944, when the population was swollen by refugees and no heat could be provided for the city. Crowded and insanitary conditions

abounded and the disease began to spread in October. Thousands of cases occurred before the following February, when for the first time in history a typhus epidemic was broken in midwinter. It was accomplished by the mammoth task of delousing nearly all of Naples' population with a new powder, DDT, used by American authorities there. Nearly a million persons are said to have been sprayed with this effective agent. This conquest of typhus is of great importance. American troops are vaccinated against the disease. It was reported in only one instance among our soldiers in Italy and that case was mild.

In other parts of the world rickettsial diseases have also become of greater importance to Americans than previously. The Southwest Pacific has presented a great problem to our forces in combating scrub typhus or tsutsugamushi fever. Many veterans of this war will probably know more about some of these diseases than do numerous practicing physicians here. Furthermore, in the decades ahead air travel may make it possible for a patient to present himself in the office of an American physician with early symptoms of such diseases contracted a week or two previously in another continent. The incubation periods are frequently long enough for this to occur.

#### CLASSIFICATION

The Rickettsioses possess throughout the world many different names for the same specific conditions. This is often attributable to the fact that a disease in one locality is not known for years to be identical with one of another name in a different part of the world. The names used have been proper names of men and places as, for example, Brill's disease, Sumatra typhus, and Mexican typhus; or the names of vectors, such as tick fever and mite typhus; or the descriptive terms of spotted fever, Fievre Boutonneuse. The standardization of this nomenclature will be difficult even after the understanding of the group is more complete. The classification of the group as now accepted is not entirely satisfactory. There are illnesses which are thought by some to be rickettsial diseases, as, for example, psittacosis and trachoma, but these have not been proved. Trench fever has been discussed with rickettsial diseases but its almost complete absence between the two World Wars left little opportunity to settle its relationship to the group. It has reappeared in Europe and may soon be classified. By excluding it for the present there are then three major groups of Rickettsioses, with a fourth minor one consisting of Australian Q fever alone. Table I is an outline of the classifications and chief features of the various diseases, but it should be remembered that the exact position occupied by some of these in various parts of the world is not yet known.

*GROUP A: Typhus fever*, both old and new-world varieties. There has been controversy over these being identical, but there are several major

TABLE I  
*Classification and Chief Features of Rickettsial Diseases*

GROUP	DISEASE	DISTRIBUTION	ETIOLOGY	VECTORS	RESERVOIRS	PROTEUS AGGL.		
						OX <sub>2</sub>	OX <sub>19</sub>	OXK
A	1. Epidemic typhus (exanthematic T., old-world T.) Brill's disease human T.	Europe, N. Africa, Belgian Congo, N. America, Asia	<i>Rickettsia prowazekii</i>	Louse ( <i>Pediculus humanus corp.</i> and cap.)	Man, rat?	+	+++	-
	2. Endemic typhus (murine T., Mexican T., flea T.), Tabardillo, new-world T.	All continents	<i>R. prowazekii</i> var. <i>Mooseri</i>	Rat flea ( <i>Xenopsylla Cheopis</i> and <i>Astia</i> ) Louse-Mex. T. ( <i>Wolbach</i> ) ( <i>Rickets</i> )	Rat	+	+++	-
	3. Rocky Mountain spotted fever (tick F., tick T.)	42 States	<i>R. Rickettsi</i> ( <i>Dermacentor</i> - <i>xenus</i> <i>Rickettsii</i> )	Wood tick ( <i>Dermacentor andersoni</i> ) Dog tick ( <i>Dermacentor variabilis</i> )	Rodent Dog	+	+	+
B	4. Sao Paulo fever or typhus, Tobia F.	Brazil, Columbia	<i>R. R. var. Braziliensis?</i>	Tick ( <i>Amblyomma Cajennense</i> )	Wild dog Opossum	+	+	+
	5. Fievre Boutonneuse (Marseilles fever, tick T.)*	Mediterranean Area, Rumania, Portugal	<i>R. R. var. Conori</i>	Dog tick ( <i>Rhipicephalus Sanguineus</i> )	Dog	+	+	+
	6. S. African tick typhus or fever*	S. Africa, Ethiopia	<i>R. R. var. Fijperi</i>	Larvae of ticks ( <i>A. Hebraneum</i> )	Dog	+	+	+
C	7. Kenya fever	Kenya (E. Africa)		<i>Rhipicephalus Sanguineus</i>	Dog	+	+	+
	8. Scrub typhus* ( <i>Tsutsugamushi</i> ), Japanese River F., Sumatra, mite T.	Japan, Sumatra, Malaya, S. W. Pacific, Java, Australia, New Guinea	<i>R. Nipponica</i> ( <i>R. Orientalis</i> , <i>Tsutsugamushi</i> )	Larvae of mite ( <i>Trombicula Akamushi</i> )	Rat, bandicoot, field mouse	- (1:160 about day. May remain negative)	- about 12-16th day.	+++
D	9. Q Fever†	Australia, U. S. A. (Montana)	<i>R. Burneti</i> ( <i>R. Diaporis</i> )**	Ticks ( <i>Haemaphysalis Humerosa</i> , <i>Dermacentor andersoni</i> )	Bandicoot	-	-	-
E	10. Trench Fever	Europe	<i>R. Wolhynica</i> ‡ ( <i>R. Quintana</i> )	Louse ( <i>Pediculus humanus</i> )	Man	-	-	-

\* Primary sore at insect bite.

\*\* Only pathogenic rickettsia passing through filters which retain bacteria.

† No rash

‡ Only pathogenic rickettsia not intracellular in gut of louse.



points of difference and they are listed here as separate but closely related diseases. They are no longer confined to their respective hemispheres, however.

*GROUP B: Spotted fever group.* Most authorities agree as to the identity of Rocky Mountain spotted fever with Sao Paulo and Tobia fevers of South America. The remaining three diseases in the group are similar clinically. Fievre Boutonneuse and South African tick fever have primary sores at the site of the insect bite, with regional lymphadenitis, as also has scrub typhus or tsutsugamushi fever, but these two are immunologically different. Fievre Boutonneuse and Kenya fever are closely related immunologically, but the latter has no primary sore. The dog is probably the animal reservoir for these three. The diseases are rather mild and have a low mortality, thus differing from Rocky Mountain spotted fever, but the strains of *B. proteus* agglutinated in all are the same as in spotted fever. Immunologically all diseases in group B are closely related, with the probable exception of South African tick fever.

*GROUP C:* This probably embraces a single disease, scrub typhus, as it is designated in recent articles by members of the U. S. Army Medical Corps. It is probably identical with tsutsugamushi disease, Sumatra pseudotyphus, mite fever, and similar conditions. The areas overrun by Japan after Pearl Harbor and, in addition, the coast of North Queensland, Australia rather closely coincide with its distribution. This disease is distinguished by the pathognomonic ulcer or eschar at the location of the mite bite.

Q fever of Australia and a newly recognized rickettsial disease in Montana must occupy a class by themselves since their rickettsial agents are filterable and the Weil-Felix reactions are negative. Furthermore, there is no rash.

Trench fever must await further study, some of which is now in progress in Europe, in order to firmly establish its relationship with the other rickettsial diseases.

It is probable that more insect-borne fevers throughout the world will be found to be rickettsial in etiology, and many have been described without rashes.

#### TYPHUS FEVER

European or epidemic typhus is closely associated with lousiness and is of no major importance among populations such as the United States, but the possibility of outbreaks is never absolutely nil even here. Riley and Haliday of the Maryland State Department of Health reported in 1932 the incidence of typhus in Maryland. They mentioned an epidemic in 1756 recorded by Brooke and gave statistics for the nineteenth century, during which epidemic typhus apparently ran its course. There were 2109 deaths

reported in Baltimore City alone between 1813 and 1886, these being mainly associated with immigration from Europe. The peak came in the years 1847 to 1851, with 505 deaths in Baltimore. This epidemic followed the great immigration from Ireland, an important focus for many years. Riley and Halliday wrote that, "History of the disease between 1813 and 1866 indicates it to have been of louse transmission." They thought that the disease has not been a problem in Baltimore since 1866. New York, Philadelphia, and the other large coastal cities also were hit heavily by the old-world typhus. Most of the recent cases of typhus in Maryland are considered to be the endemic flea-borne disease.

It was not until 1909 that the louse was shown to be the vector of European typhus by Nicolle, Comte, and Conseil, French investigators. This was three years after Ricketts found the vector of Rocky Mountain spotted fever. Ricketts and Wilder in 1910 described the micro-organism now called *Rickettsia* in smears of the intestinal contents of lice infected with typhus. Da Rocha-Lima expanded the studies, noted the intracellular feature, created the genus *Rickettsia*, and called the typhus agent *Rickettsia prowazek'i*. Von Prowazek was a Polish investigator who also died of typhus acquired accidentally in the laboratory. The work of Wolbach, Todd, and Palfrey (17) in 1919 to 1922 confirmed the etiology by well organized experiments in Poland.

The European disease is spread by a man-louse-man cycle without any proved animal reservoir, although several species of animals can be experimentally and perhaps naturally infected. The transfer of infected lice from a patient to a new victim who may be bitten is one means of infection. Contact with or inhaling of dried feces from infected lice is another method, this accounting for accidental infection in investigators, doctors, and nurses. A pathologist contracted the disease at autopsy in World War I and developed symptoms twelve days later. No vector other than the louse is now known to transmit epidemic typhus, except experimentally. The louse always dies within two or three weeks because of the disruption of its digestive mechanism by the rickettsial proliferation in the lining cells of its stomach and intestines (16). Both the head louse and body louse can transmit typhus (1). The louse is infectious within four to seven days after it becomes infected. The virulence of the *Rickettsia* is increased by louse passage if it has been attenuated previously. The infection is not hereditary in lice nor is it known to be venereal. Without animal reservoirs humans may play the carrier rôle, and late recrudescences of typhus in previously recovered patients is indicated by the recent work of Zinsser (18). These details in epidemiology need clarification. The common bedbug was infected with Mexican typhus by Zinsser and Castaneda (18) but its bite did not cause infection. Anderson and Goldberger (2) fed

bedbugs on monkeys infected with European typhus and even injected crushed bugs subcutaneously, but got no results. Another disease transmitted by the human louse is relapsing fever, a spirochetal disease of Europe, North Africa, China, and even North America.

Typhus fever is a relatively mild disease when transmitted to animals. The usual method employed is intraperitoneal inoculation with the blood of patients or macerated lice. There is no apparent infection in the rat and merely a mild infection in the guinea pig. In sharp contrast, endemic or murine typhus causes a febrile course in rats and a severe scrotal swelling in guinea pigs because of the acute inflammatory and exudative reaction of the tunica vaginalis (Neill-Mooser reaction).

Epidemic typhus fever in man is a winter disease primarily, because of factors of heavy clothing left on for several days and infrequent bathing which permits heavy louse infestation.

*Clinical features.* The incubation period is variously given from five to twenty-one days, generally eight to twelve. The onset is usually abrupt with a rapid rise in temperature, possibly following a chill or even collapse while at work. In some cases the fever may be preceded for one or two days by general malaise, headache, anorexia, and perhaps nausea. With the onset, severe headache, either generalized, frontal or occipital, almost constantly occurs and lasts several days or throughout the illness. As the temperature rises to from 103 to 105 F. repeated chills are the rule. This fever usually reaches a maximum within or is maintained at the above level for a week with morning remissions.

During the second or early part of the third week, the fever falls by lysis. The accompanying features are briefly: severe aches in the limbs, great weakness, cardiac incompetency, constipation, apathy, confusion, even delirium and coma, a rapid pulse rate ranging between 110 and 125, and increased respirations until lysis, also the characteristic rash. All of these features vary in severity.

As a rule, the rash appears between the fourth and eighth days and in its early stage is pinkish and macular. It begins on the chest and upper abdomen and spreads centrifugally to the back and upper arms, and in a lesser degree to the lower arms, neck, legs, palms, and soles, although the face rarely is involved. The early lesions are oval, somewhat irregular, discrete, slightly rough macules often measuring 5 to 6 mm. in diameter. They blanch at first on pressure but later become darker, petechial, and even gangrenous.

If recovery takes place all symptoms and the rash subside quickly after defervescence, except the weakness and perhaps the cardiac status. Death usually occurs in the latter part of the second week in fatal cases and follows days of coma and perhaps tachycardia, when the pulse rate is above 130.

The mortality has been from 10 to 50 per cent or higher, and was approximately 25 to 30 per cent in Russia following World War I. The percentage is higher in the older age groups and often rather low in children.

Complications frequently seen have been bronchopneumonia, parotitis, otitis media, incipient cardiac failure, hypotension, decubitus ulcers, gangrene of the digits, and phlebothromboses, the latter two conditions often considered part of the disease. Otherwise there are no sequelae, the disease being self limited.

Laboratory findings may include leukocytosis, with 10,000 to 15,000 white blood cells per cubic mm. However, normal counts and even sub-normal ones frequently are seen. Dehydration may be reflected in the erythrocyte count, and albuminuria as part of a febrile illness may occur.

The Weil-Felix reaction usually becomes positive in the first or second week, with the highest titer by the end of the third week, and then subsides rather rapidly. The OX<sub>19</sub> strain of *B. proteus* is agglutinated by serum diluted 1:100,000 in some cases. This reaction was discovered in Rumania in 1915 when the *B. proteus* was found in the urine of a typhus patient. Agglutination by the patient's serum and other typhus serum led to the belief that Rickettsias are related in some way to the *Proteus*. It has been postulated that the two are stages in the life cycle of one agent but no evidence indicates that this is true. It is probably explained by the presence, in the two, of a common carbohydrate antigen, as indicated by the work of Castaneda mentioned by Pinkerton (12). Only the X strains are agglutinated and OX<sub>19</sub> is the usual one used. False reactions may occur in other diseases in titers up to 1:640 (6).

A complement-fixation test more specific than the Weil-Felix reaction has recently been developed.

*Pathology.* The gross pathology shows no unusual characteristics. The skin rash, petechial hemorrhages, or gangrene may be seen; moderate splenomegaly and cloudy swelling of the viscera are usual findings, as is the complication of bronchopneumonia. Focal liver necrosis, thrombosis of the larger vessels, and cerebral edema are seen occasionally. Microscopically the disease is well named *endangiitis*. The Rickettsias invade the endothelial cells of small vessels, arterioles, capillaries, venules, and occasionally the larger vessels. There is first swelling and proliferation, then necrosis and thrombosis. The latter condition is responsible for petechiae and gangrene. Perivascular nodules known as typhus nodes, consisting of monocytes, plasma cells, and lymphocytes, are characteristic and found in several organs, most commonly in the skin, brain and heart. In the brain, neuroglia cells are seen in these lesions, which are pericapillary. Rickettsia often can be found in the skin by biopsy.

*Treatment.* Preventive treatment at first consisted of improving body



hygiene and living conditions. Wars and famine reverse any progress so made. Insecticides were only partially effectual. The new DDT insecticide previously mentioned is apparently potent. Vaccines were prepared by Weigl in 1930. He inoculated lice rectally and later ground them up. Spencer and Parker heretofore used a similar method in treating Rocky Mountain spotted fever. Fifty lice were necessary for one vaccination, hence this method had no practical application. Dead Rickettsias must be in high concentration if such vaccine is to be effective in establishing immunity. Live Rickettsias are too dangerous unless neutralized by convalescent serum, and the combination gives immunity to the guinea pig. Zinsser and Castaneda (19) have made a vaccine from Rickettsias grown in enormous numbers on agar tissue culture slants. American soldiers are vaccinated with the material grown on the yolk sac as recently accomplished by Cox and are significantly protected, but complete information on its use is not yet available. Doctors and other attendants must wear special louseproof coveralls in the sick room, and great care should be taken in handling the patient's clothes and in cleansing his hair and skin.

Passive immunity and the therapeutic use of antisera are still in an experimental stage. A hyperimmune rabbit serum shows some possibilities, its early results being encouraging (6). At present the treatment is supportive and symptomatic, but these aspects are of the greatest importance in nursing the patient back to health. Nutrition, fluids, minerals, vitamins, and good nursing care are major adjuncts and may significantly affect the course and outcome. Aspirin, codein, digitalis, and laxatives have their usual indications but many clinicians advise against the use of morphine. Convalescence should be one of prolonged rest, chiefly because of myocardial damage resulting from the specific lesions therein or from the continuous fever. The disease establishes an immunity but it is not necessarily permanent.

#### ENDEMIC TYPHUS

This form was first discovered in 1926 by Kenneth F. Maxcy (10), an American, who found typhus to be endemic in the southeastern states without association with louse transmission. Mooser first demonstrated the causative organisms of this type in great numbers in the scrotal sacs of guinea pigs injected intraperitoneally with the blood of patients having the disease. Mooser's name was used for this variety of Rickettsia, which, however, is morphologically identical with the European agent. Subsequent work (7) has shown this type to be transmitted to man by the accidental bite of the rat flea which has fed on infected rats. It prefers the latter host, but in prisons and crowded quarters where rats abound the flea may bite man. Other rodents and vectors may be infected but are not important in the spread of this murine typhus, so called because of its reservoir in rats.

There has been great confusion in the past two decades with regard to the locale in the classification of rickettsial diseases, of Brill's disease, tabardillo, and louse-borne typhus in Mexico. Brill's disease was first described as occurring in the eastern coastal cities among Jewish immigrants. It has since been shown (2, 18) that it is of the epidemic European type, yet many recent publications include it with the endemic or murine type (6).

Epidemic louse-borne typhus does appear occasionally in nearly all parts of the globe, and these cases may be considered endemic in the same sense that other diseases are endemic in a locality. Endemic typhus in this discussion, however, signifies the murine or new-world variety. In Mexico this endemic typhus is both louse-borne and flea-borne. The louse-borne cases have been called tabardillo by the Spanish, but the writer has read of no feature other than the vector relating it as closely to the European type as to the murine type. Wolbach (16) felt that it belonged to the murine type.

Murine and European typhus are closely related immunologically but there are also definite differences. Clinically the two types are similar qualitatively, but the endemic disease is definitely milder.

It has usually been assumed that typhus was brought to the New World after its discovery, which may be true, for outbreaks followed the Spaniards into Mexico and South America. It has been postulated that the differences between the endemic and the epidemic types are perhaps the results of the change of host and vector, and that the centuries have altered one disease and given a new variety. However, it has been said that there is evidence that typhus existed in the New World before the Columbian Era. Zinsser believed that the louse may be the last of the series of insect hosts to be involved by typhus, for the disease was persistent in humans long before the louse began transmitting it. The fact that the infected louse dies is in keeping with such a surmisal.

Endemic typhus appeared in Baltimore in 1931 and Dr. L. A. M. Krause traced the infection to wild rats. Energetic measures to destroy the rodents were used successfully and the endemic was controlled.

Experiments have been described (11) which indicate that chemotherapy in rickettsial diseases is promising. Toluidine blue when fed to mice appreciably reduced the fatality rate in mice receiving intraperitoneal injections of endemic or murine typhus agents grown on yolk sacs. This reduction was from 80 to 25 per cent if the drug was administered at the same time infection was introduced, and to 50 per cent if treated twenty-four hours after infection. Forbisen, another drug that was tested, has given less therapeutic effect.

#### ROCKY MOUNTAIN SPOTTED FEVER

The first descriptions of this disease were given by Wood in 1896 and Maxcy in 1899. Ricketts' work already has been mentioned. Riley wrote

that there was some evidence that Indians in the western states suffered from it before the white men arrived in about 1850. It was observed as early as 1880 by physicians.

Until 1914 the disease was known only in seventy-eight counties of the Rocky Mountain section. Now forty-two states are on the list of its invasion (3), with predominance in the original localities, and with Maryland, Virginia, and North Carolina as the next most important areas. Between 450 and 600 cases a year are reported throughout the country.

The eastern cases were first reported in 1931 by Rumreich, Dyer, and Badger (14). Opinion as to the identity of the eastern and western varieties still is not unanimous, Zinsser (18) saying there are differences which suggest they are not entirely identical. The scrotal reaction and mortality in guinea pigs are much less in the eastern variety. The mortality for humans is approximately 28 to 30 per cent for the western and 18 to 22 per cent for the eastern types. Pinkerton (12) listed them separately, but Wolbach (17) saw no reason for separating them. Any differences may be the result of the adaptation of the agent to the vector of the East, the dog tick. Immunologically they are identical.

This Rickettsiosis is primarily a disease of small rodents and other animals and is transmitted in that kingdom by several species of ticks, some of which will feed on man. The only ones which are known to spread the disease to man are the wood tick, *Dermacentor andersoni*, in the western states, and the dog tick or *Dermacentor variabilis*, in the East. Rickettsial infection in ticks is both venereal and hereditary, passing through generations, and the ticks recover. During the winter they hibernate and venture forth in February (wood tick) or March (dog tick) with greatly decreased infectivity, because the Rickettsias are of low virulence after hibernation. Warm sunrays, artificial incubation, and feeding rather rapidly reactivate the organisms. In Montana only one in 300 ticks is found to be infected. Reservoir hosts include the chipmunk, rabbit, mountain rat, ground squirrel, lynx, badger, coyote, goat, sheep, and bear (9).

In the West, cases are reported from February to September, with the peak incidence from March through June. In the East, the season lags a month or two behind that of the West, the peak occurring from late May through July, with extremes in March and December.

The etiologic agent of spotted fever is sufficiently different from that of typhus to merit a separate genus. It is called *Dermacentroxenus rickettsii*. One difference is the intranuclear invasion of the latter, rarely seen in the typhus organism; another is the presence of spotted fever Rickettsias in the smooth muscle cells of blood vessel walls, in addition to the endothelial cells. Immunologically spotted fever is unrelated to typhus.

The incubation period is given variously as from two to fourteen days, the usual time being from four to seven days. It is thought that several hours'



feeding by the ticks are required for infection to occur, and that removal of the tick in two hours reduces the chances of infection almost to nil. Prodromal symptoms may precede the actual onset by three days and consist of malaise, headache, chilliness, and restlessness. The onset is characteristically abrupt, often beginning in the late afternoon with a chill and a rapid rise in temperature within eighteen to thirty-six hours to 103 or 104 F. Headache, occipital or frontal, and aching or even pain in the muscles and joints, especially of the back and legs, make their appearance on the first day, followed on the second to fourth or fifth day by the characteristic rash which has a different distribution from that of typhus.

The rash of spotted fever usually begins on the wrist, ankle, or other parts of the extremities, the flexor surfaces dominating. It spreads thence to the trunk, thus reversing the route followed by typhus rash. The forehead, back, chest, and abdomen are involved successively. Other parts later involved may include the palms, soles, the pharynx, the scalp, and even the inner surfaces of the cheeks (3). The lesions are first pinkish red macules which blanch on pressure and then become papular, petechial, hemorrhagic, and perhaps necrotic and gangrenous, as in typhus. The rash may be modified by vaccination as well as by natural variations in severity not well understood. After defervescence, which occurs within two or three weeks, the rash begins to fade and may desquamate. Pigmentation and minute cicatrices may remain, according to Baker (3). He further described a mottling which occasionally precedes the actual rash and which occurs on the face, neck, and upper chest. Aside from the rash, the clinical features in the main resemble typhus fever and will not be repeated here.

Laboratory procedures usually reveal leukocytosis, often 10,000 to 13,000 white blood cells and occasionally more, and agglutination of all X-strains of *B. proteus*. Dyer (6) reported that OX<sub>2</sub> is agglutinated much more frequently by the serum of spotted fever cases than by that of typhus. He said further that when agglutinins for both OX<sub>19</sub> and OX<sub>2</sub> are present in a given case those for OX<sub>19</sub> are usually higher and appear toward the end of the second week of the disease, or they may be delayed until early convalescence and may even be absent in proved cases. It is advisable that the agglutinations be determined when the disease is first suspected, again on the twelfth to fifteenth day, when it is usually positive though perhaps weak, and again during early convalescence, when it is, as a rule, definitely positive.

Plotz and Wertman (13) described a complement-fixation test which is specific for Rocky Mountain spotted fever and negative for other rickettsial and similar diseases. Its specificity is a valuable aid in differentiating this disease from typhus when both exist in the same locality, since the Weil-Felix reaction does not differentiate them.

The pathology is again a specific endangiitis, but with more brain lesions than are found in typhus, especially in the midbrain, pons, medulla, and



cerebellum (6). The preventive treatment of spotted fever should include: 1) annual vaccination early in each season of those individuals most often exposed to tick bites, such as lumbermen, road gangs, hunters, and farmers; 2) frequent inspection of the body and clothing, at least every few hours, during exposure to ticks; 3) the wearing of clothing which provides protection against the attachment of ticks; 4) removal of the ticks by gradually warming them with a match until they drop off, or with forceps, but not with the fingers; crushing should be avoided because skin abrasions may serve as the entry for agents of the disease; and 5) measures to reduce the tick population, which is not practical at present.

The treatment here as in typhus has been supportive. Sulfonamides have been of no benefit and have even increased the morbidity and mortality in guinea pigs (6). Penicillin has produced disappointing results (8). In May, 1943 Topping (15) reported fifty-two cases of spotted fever treated with immune rabbit serum before the third day of the rash. Only two deaths occurred and these were in males, one 66 and the other 72 years of age. This gave a mortality rate of 3.8 per cent, compared to an expected rate of 18.8 per cent based on earlier statistics. In animals the effectiveness of immune serum is pronounced if given early and varies inversely with the time interval between infection and serum administration.

This serum was prepared by inoculating rabbits with material prepared from yolk sacs on which Rickettsias had been allowed to grow. Antigen prepared directly from infected ticks will also produce antibodies. The serum may be purified and concentrated, as in the manufacture of anti-pneumococcus serum. It should be given within the three days following the development of the rash, during which time *Proteus* agglutinations are usually negative, and in amounts of one cc. per kilogram of body weight. Topping's report showed some decrease in fatality rates in patients receiving serum after the third day, but this is not nearly as great as the decrease seen in the early treatment.

In 1939 Carey (5) reported on all cases of Rocky Mountain spotted fever admitted to the University Hospital since 1930. There were twenty-six of these, all carefully described clinically. Twelve deaths occurred, a fatality rate of 46 per cent.

#### FIÈVRE BOUTONNEUSE

This disease, prevalent in the Mediterranean area, is similar to Rocky Mountain spotted fever but milder and with a fatality rate of less than 3 per cent. It differs in that a primary lesion is frequently present, presumably at the site of the tick bite. This is called the *tache noire* or black spot. Regional lymphadenitis may develop.

African tick bite fever and Kenya fever are included in Table 1 for clas-

sification but will not be described. Much work needs to be done with regard to their relationship or identity with other members of the group and to their pathology.

#### SCRUB TYPHUS

The descriptions of tsutsugamushi and scrub typhus are practically identical in all respects and it is probable that they are one and the same disease. It is apparently transmitted by the larvae of a mite, in which insect it is hereditary. Reservoirs are thought to be field mice, bandicoots, and possibly other small rodents. It is a major problem in the Armed Forces in the Southwest Pacific (4). The cases are more frequent when new troops are brought to one of the jungle islands, and after six weeks only sporadic ones occur. It appears that the greatest danger zones are where tall kunae grass borders upon the jungle, which is the place most favorable to the growth and activity of mites.

The clinical course is somewhat similar to the other rickettsial diseases, with several exceptions. The incubation period is ten to eighteen or more days. The prodromal malaise, the sudden onset with headache, chilliness, prostration, continuous fever with morning remissions, and falling to normal in about fourteen to sixteen days, are usually of about the same pattern as in the diseases already described.

The rash appears first on the trunk from the fifth to the eighth day and spreads to the extremities. It does not become petechial (6); it may reach its height in four days and fade in six to seven, or it may be evanescent, appearing and disappearing much more rapidly.

The characteristic primary ulcer or eschar with its necrotic center measuring 2 to 5 mm. in diameter, crusted if dry, its surrounding pink areola, and the regional adenitis are all usually present. Dyer gives the overall fatality rate as 15 per cent.

The only strain of *B. proteus* agglutinated in this disease is OXK, and even this may be negative. It is usually positive after ten days, its highest titer occurring in early convalescence. The pathologic change is basically similar to but milder than that in typhus. The brain lesions resemble those of spotted fever. Pneumonitis and slight splenomegaly are usually present as in other Rickettsioses.

Treatment is nonspecific. The administration of penicillin has no effect (4). Convalescence is prolonged. Special care in erecting campsites is required in the Pacific theatre of operations, native labor being used to clear away the kunae grass and to burn the ground with oil.

#### Q FEVER

Derrick first described this disease in 1937, in Australia, as occurring chiefly in dairy farmers, abattoir workers, and forresters. It is thought to

be identical with or similar to the nine mile fever of Montana. In this disease X strains of *B. proteus* are not agglutinated and the Rickettsias pass bacterial filters. No rash develops according to Dyer (6), but Pinkerton (12) mentioned an atypical and mild rash in two Australian cases. The Rickettsias grow both intracellularly and extracellularly in infected tissue, *in vivo* and *in vitro*. The disease probably is tick-borne. The bandicoot, a marsupial, is probably the animal reservoir in Australia, but the American mammalian host has yet to be found. The agents here were first found in the wood tick. The disease is febrile, the fever lasting from a few days to three weeks. The pulse rate is lower than the fever would indicate. There is one important difference between the Australian cases and one series of recent American cases. The latter occurred as an outbreak in Washington, D. C. a few years ago among laboratory workers. It showed a pneumonitis of an atypical form, with roentgenologic and pathologic evidence but scanty physical findings. Clinical evidence of pulmonary consolidation was found in only one Australian patient, according to Pinkerton, but no roentgenologic reports were made in the cases there.

The disease is usually mild but occasionally may be severe. The fatality rate is almost nil. One American patient died. It seems possible that this disease can be spread by droplet infection (6) and, if so, it may be more common than is known even here. The possibility of epidemics must be considered.

#### TRENCH FEVER

Trench fever is a febrile louse-borne disease typically showing a rash, but with a variation of other symptoms. It was first recognized in World War I, and was thought to be rickettsial because of the organisms seen in the intestinal contents of lice fed on patients with this disease. These were extracellular, and evidence points toward their rôle as the etiologic agent. The death rate is nil (6) and the Weil-Felix reaction is negative. There is no specific treatment or vaccine yet developed. Its reappearance in Europe may elucidate its nature and treatment.

#### SUMMARY

It has not been the purpose of this paper to describe all the Rickettsioses even in moderate detail. The bibliography contains references to exhaustive discussions of the present knowledge of this group of diseases. The future of this worldwide congeries of maladies holds a multitude of fascinating problems which embrace the fields of zoology, parasitology, immunology, chemotherapy, and other subjects. Wolbach (17) predicted the discovery of rickettsial diseases in domestic animals. He suggested that other diseases of man may fall into this group as, for example, periarteritis nodosa, because of the vascular lesions.

The rodents of the globe and their ectoparasites would appear to present an insurmountable problem in combating this group of diseases. At present one must turn to vaccines, sera, and drugs to serve as therapeutic and prophylactic agents.

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## EPIDEMIOLOGIC HIGHLIGHTS—BALTIMORE, 1944\*

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It is appropriate that the physicians of the city receive periodically from the Baltimore City Health Department an oral report on the recent and current communicable disease experiences, a report supplementing the written reports which are given them monthly by way of the Baltimore Health News, yearly through the annual reports, and occasionally by letters addressed to them personally. These reports are largely a compilation of the reports which private physicians, hospitals and others send to the official health agency together with data procured at the time of investigation by health department personnel. Many physicians here have helped collect the fundamental data on which the present report is based. Many of the patients were treated by members of the Baltimore City Medical Society or referred by them to Sydenham or one of the other hospitals having facilities for the care of communicable diseases. Undoubtedly the number of deaths would have been greater if the private physician had not given the proper care, and also the number of cases would have been larger had he not been alert to his responsibilities and taken advantage of the many opportunities open to him to protect community as well as individual health. The private physician is in the first line of defense against communicable diseases. I think it can be said with some seemly pride that in the communicable disease control program Baltimore physicians and hospitals do their work well.

Having been a private physician I know how great is the temptation to fail to report communicable disease cases promptly and how difficult it is to keep oneself convinced that these reports are in fact important, vital, basic scientific data rather than just some more bothersome red tape.

Baltimore physicians can be reassured that communicable disease reports when received by the Health Department are given the attention they require. Information from them is analyzed carefully to the best of our ability, and the measures taken to prevent or control communicable diseases are based on the findings.

At the end of the first week of this year, in his regular Saturday morning letter to the mayor reporting health conditions in the city, a copy of which is always available to the press, the Commissioner of Health wrote that "A sharp drop in the number of deaths from influenza and pneumonia occurred

\* Address given at the meeting of the Baltimore City Medical Society, October 20, 1944.

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during the week ending January 7, 1944." The month of January saw a continuation of the decline of the outbreak of influenza which occurred in Baltimore during the last part of 1943.

Shortly after the first of the year one of our outstanding newspapers published a lead editorial entitled "Our Typhoid Fever Record and the City Tax Rate." It pointed out that last year, 1943, Baltimore had fewer cases of typhoid fever than in any year since we have been keeping mortality statistics. It gave the difference between the number of typhoid fever cases in 1910, about 1900 cases and 235 deaths, and the twenty cases and one death which we had last year. It pointed out that in the years immediately following those record high figures Baltimore installed its modern sewer system, expanded and improved its water supply, enacted the milk ordinance, and introduced the health program designed to ferret out typhoid carriers and prevent them from spreading the disease. These things have cost money. The editorial's theme is that public health is purchasable and that money spent by a community for the achievement of a high public health level is money wisely and well expended. In 1944 so far we have had only twelve cases of typhoid fever and no deaths, so there is reason to expect that this year will show an improvement over last year's good record. We still have seventy-three typhoid carriers under supervision, but many of them are getting old, inactive, and will soon die. Few new carriers are being developed.

Diphtheria presents a darker picture although, like typhoid fever, for many years the program for its control has been emphasized and, in general, has met with spectacular success. Since the beginning of 1944 to October 20, 1944 there has been a total of 183 cases of the disease with ten deaths.

The diphtheria outbreak which occurred in Baltimore during the period from the first of January to the end of July, 1944 had its peak during the month of April, a month in which there were thirty-eight cases and five deaths. During the six months' period there was a total of 148 cases and nine deaths. A definite localization of the outbreak was observed in the Southeastern Health District and the neighboring part of the Eastern Health District, although scattered cases occurred elsewhere. Many were found in persons of Polish descent living not far from Patterson Park.

Most of the fatal cases were of the *bull-neck* type, with extreme swelling and edema of the neck, which in spite of early and large doses of antitoxin steadily became worse. We have taken part in an endeavor to better understand the etiology of so-called bull-neck diphtheria but have not been successful as yet.

One of the chief measures for the control of the epidemic was an active campaign urging that in the particularly affected areas of the city all children under the age of twelve years be inoculated, or reinoculated, with diphtheria

toxoid. First, letters were sent to private physicians telling them of the campaign and informing them how, for their patients, they could easily obtain toxoid from the Health Department. Throughout the special control program private physicians played a role of prime importance. In this campaign the newspapers, large and small, daily and weekly, played a prominent part. Small magazines and church bulletins also carried articles on diphtheria prevention. All radio stations helped by spot announcements. Radio plays having as their moral "Protect your Child by Diphtheria Toxoid" were presented.

Streetcars and buses carried placards urging toxoid inoculations. Large placards were carried on the outside of all streetcars and buses, and nearly all of them carried smaller attractive posters inside.

Hundreds of drugstores and restaurants displayed similar toxoid placards.

Letters were written to several hundreds of parents; special programs were carried on in schools. The routine educational procedures which, over the years, have proved effective in getting children protected from diphtheria, such as the letter from the Commissioner of Health which every child born in Baltimore receives at the age of six months, were, of course, continued as usual.

Special clinics were set up in the Southeastern Health District and not only in that area but in all parts of the city private physicians were called upon to give thousands of toxoid inoculations. During the first five months of the year we received records of the administration of 22,953 toxoid inoculations, more than the number given in the entire previous year.

Although the diphtheria outbreak was over by the last of July, we are now again having an unusually large number of cases of diphtheria reported. Again, as you perhaps have noticed through the newspapers, parents are being urged to have their children inoculated if they have not yet received toxoid. Arrangements are being made to carry on another intensive anti-diphtheria campaign. Private physicians, of course, will continue to do their part.

This year meningococcus meningitis continues to be unusually prevalent. During the first forty weeks of the present year 152 cases and twenty-eight deaths were reported, as compared with 331 cases and fifty deaths during the corresponding period of 1943. In the first forty weeks of 1944 we have had approximately the same number of cases as during the corresponding period in the years 1942 and 1941, but many more than during the corresponding period in the years 1940 and 1939. We still have this *crowd* disease with us although, compared with last year, in decreased prevalence.

At the end of the first forty weeks of 1944 we had a total of 1823 cases of scarlet fever, the largest number for the corresponding period of any recent year since 1927. During the first forty weeks of 1943 the number of scarlet

fever cases was 1231, a total not exceeded during the corresponding period of any year since 1935. It is probable that because of the elimination of the quarantine placard reporting has improved and the actual increase in the number of cases is not as great as the increase in the number of reports received. Many physicians have remarked on the mildness of the scarlet fever cases seen in recent months. There has been only one death.

During the first forty weeks of 1944 we have had 10,514 cases of measles, the largest number for the corresponding period of the year since 1939. A fairly active educational program has been conducted to make parents understand the importance of protecting from measles children under the age of three years by keeping them away from older persons suffering from the disease or, if they have been recently exposed, by promptly giving them enough immune globulin to prevent or at least modify the disease.

Generally, 80 per cent of all deaths from measles occur in children under four years of age, and 75 per cent of all measles deaths occur in homes of people of low income, in zones of overcrowding and poverty. This year, more than ever, care has been taken to afford young children living in poor, crowded homes protection from measles as far as this is possible under prevailing conditions. So far this year we have had ten deaths from measles.

The recent poliomyelitis outbreak undoubtedly has been considered by the public as being the outstanding communicable disease occurrence of the year. It has attracted much attention and caused great alarm. Continually, until the last week or two, health department telephones have been kept busy by perturbed parents asking for information or making suggestions, sometimes quite forcibly, with regard to what the health authorities should do to control the outbreak. At times it has been difficult to remain rational amid public clamor for measures that, though often proved to be ineffective, appear to the layman to give promise of putting a speedy end to the spread of the disease. So far this year we have had 149 cases and eleven deaths from poliomyelitis.

Poliomyelitis was dealt with fully in a symposium occupying the entire program of this Society's last meeting on October 6, 1944, so it is unnecessary to speak of it further.

Until this year, not since 1931 have we had a rabid dog in Baltimore. This year we have had four. Because of these dogs and the prevalence of rabies in dogs in the adjoining counties, dog quarantines have been established in various sections of the city on four occasions this year. The dogs found rabid were stray mongrels. With the help of the police and the Baltimore Society for the Prevention of Cruelty to Animals many stray, ownerless dogs have been eliminated, an important step in the control of rabies.



The woman bitten by the last rabid dog found is now completing a course of treatment with rabies vaccine.

The presence of rabies among dogs in and near Baltimore has stimulated the reporting of dog bites. Since the first of the year 2120 bites have been reported. Each report, of course, has been followed by the required health department action to protect the bitten person and to determine definitely that the dog does or does not have rabies. The last human death here from rabies was in 1930.

In the control of communicable disease the Baltimore City Health Department has not found 1944 a quiet year.

## HOUSING AS A PUBLIC HEALTH RESPONSIBILITY\*

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How discouraging it must be for the health officer investigating a case of meningococcus meningitis or a public health nurse making a home visit to a tuberculosis patient to find families living in grossly overcrowded conditions, four or more persons sleeping in a dark, damp basement without light or ventilation, one choked and overflowing yard toilet being used by several families, the entire house overrun by rats and vermin, ceilings falling down because every time it rains the roof acts merely as a sieve and extreme dampness permeates the house, plumbing deteriorated to the degree that sewage leaks from the upper floors into the basement, and the entire structure presenting a picture of dilapidation. Living under such conditions how ironic it must seem to endeavor to tell these families anything about hygienic living, public health or preventive medicine.

Such slum conditions are not unusual in Baltimore. The following are typical examples of reports received by the Housing Division from health officers, public health nurses, social service departments of hospitals, the City Welfare Department, and other official and nonofficial agencies:

1. — Street. Overcrowded with tenements. Sink is stopped up. A dilapidated toilet on the second floor leaks into the dining room below. Rat infested. Defective floors. Plaster is falling down. Electric wiring condemned by the Gas and Electric Company.
2. — Street. Overcrowding, fifteen people in four rooms. A bed in the kitchen. One tenant has just returned from the tuberculosis sanatorium.
3. — Street. A mother and nine children live in two rooms on the third floor. They sleep in one room and get water from the first floor. There is a defective yard toilet. The husband died at Crownsville State Hospital a year ago.
4. — Street. Twenty-two persons, fourteen of these children, live in six rooms. The yard toilet is defective and dilapidated. Nine persons sleep in one room. Rat infested. House is dilapidated.

Should the Health Department be complacent about the slums because it is difficult to state definitely that the many factors which go to make slums are responsible for the ill health of the occupants? Let me quote from an

\* Presented at the meeting of the Baltimore City Medical Society, October 20, 1944.

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address of Mrs. Edith Elmer Wood, one of the outstanding authorities on housing in this country:

"The Bureau of Animal Industry in the Department of Agriculture issues a long series of farmers' bulletins on the housing of live stock—dairy cattle, beef cattle, horses, sheep, hogs, and poultry. It comes out roundly with delightfully dogmatic statements, such as: 'Dryness, good ventilation, and freedom from drafts are the first requisites of buildings for sheep.' 'If little pigs are to get the right kind of a start in life, they must have plenty of sunshine.' 'Growing chicks and laying hens need comfortable homes that are dry and roomy with plenty of fresh air and sunlight. It never pays to overcrowd them.' Fortunate farm animals! No one writes doctors' theses to prove that there is no causal relation between their health and their housing."

Dr. C. E. A. Winslow, Professor of Preventive Medicine at Yale University and chairman of the American Public Health Association Committee on the Hygiene of Housing, writes that, "In the absence of such data, we may profitably turn to the testimony of that rare commodity which we ironically call common sense."

Data of the National Health Survey conducted by the United States Public Health Service from November, 1935 to March, 1936 indicated that:

1. Frequency of illness disabling for a week or longer is greater in crowded households.
2. There is a definite increase in the incidence of pneumonia and tuberculosis with an increase in crowding.
3. The common communicable diseases of childhood show an earlier age incidence in crowded households.
4. The rate for digestive diseases for persons in households without private inside flush toilets showed a considerable excess over the rate for persons in households having such facilities.

It seems plausible to expect the Health Department to take an active interest and responsibility in ridding the city of slum housing conditions and in making an effort to see that housing occupied by tenants meets the minimum sanitary requirements for health and safety. Ordinance provisions incorporated in the former City Building Code authorized the Commissioner of Health to act in the correction of conditions in dwellings considered dangerous to life or health. In 1939 the attention of the Health Department was called to St. John's Court by the Baltimore Housing Authority. Inspection of this group of nine houses showed it to be probably Baltimore's worst slum. The houses had no inside plumbing whatsoever, no electricity, and no gas. Two frostproof hoppers in the courtyard were the only toilet facilities and an obsolete yard hydrant was the only source of water for drinking and washing purposes. Stairways, walls, and floors were

in a state of disrepair and there were many apparent structural defects of the buildings themselves. The Commissioner of Health wrote the Buildings Engineer that in his opinion these dwellings were unfit for human habitation from a sanitary and health standpoint and recommended that they be condemned for demolition. On the basis of this recommendation the buildings were posted by the Buildings Engineer and they were promptly torn down. This was the beginning of a program for sanitary housing in Baltimore by the Baltimore City Health Department.

With some trepidation the inspections of slum houses were continued and with the cooperation of the City Buildings Engineer a number of these were vacated and torn down. Encouragement was received from the public and particularly from the press. You are probably familiar with the photographs and vivid descriptions of some of these places that appeared on the editorial page of the *Evening Sun* with such titles as:

THE GREAT WALL OF PINE STREET

THERE'S GOLD IN SLUM HOUSING

RATS AND A BATHTUB

THIS HOUSE HAD THE HONOR

Progress in eliminating slum housing conditions went on uncontested until late in 1940 when the owner of two slum dwellings on Moore Street refused to comply with Health Department notifications because in his opinion the Negro occupants did not deserve better housing. He frankly said so and continued to take his rent from them. A show-cause summons to the magistrate's court resulted in a demand for a jury trial, Grand Jury proceedings, and finally the sentence and payment of a fine in the Criminal Court in June, 1941. This trial brought out technical weaknesses in the ordinances under which the Health Department was acting and it was found advisable to transfer this particular subject matter, powers, and authority from the City Building Code in the form of a new ordinance to Article 16 of the Baltimore City Code which bears the title "Health."

The ordinance was drafted as "An Ordinance On The Hygiene of Housing" and was enacted and approved on March 6, 1941. At last the Commissioner of Health was given separate authority to proceed to enforce a program of sanitary housing in Baltimore. An ordinance amending the existing Rooming House Ordinance was approved on June 28, 1941, and in accordance with the authorization of both of these ordinances the following regulations were adopted in 1942:

Rules and Regulations Governing the Hygiene of Housing

Rules and Regulations Governing Rooming Houses, Lodging Houses,  
and Hotels

Rules and Regulations Governing Trailer Camps

The objective of these ordinances and regulations is to set up minimum standards for housing of all types, and the responsibility of both owner and



tenant are included. In 1943 the City Housing Code containing the ordinances and regulations previously mentioned, together with the nuisance abatement ordinance, was published.

Efforts to thwart the Health Department in its sanitary housing program were anticipated. Slums had been a good investment to those property owners who found no need for additional investments for upkeep. One landlord found guilty in the Criminal Court of violating the ordinance on the hygiene of housing appealed on the ground that the ordinance was unconstitutional and gave illegal power to the Health Commissioner. The case was argued before the Court of Appeals of Maryland. In handing down a decision approving the constitutionality of the ordinance, the Court of Appeals declared that:

"The only purpose of the ordinance is to protect and preserve the health of the people of Baltimore . . . and that

. . . "the city has the power under its charter 'to preserve the health of the city' and 'to prevent and remove nuisances.' The exercise of charter powers by a city is not discretionary, but is a duty."

Beginning with one housing inspector in 1940, the City Health Department staff has been enlarged to eight inspectors with a chief in charge of a new division of housing. The impact of the war, with the attending immigration of thousands of war workers and their families during the period when the City Health Department program on sanitary housing was in its infancy, resulted in what appeared to be an almost hopeless situation. Families were crowded into any available space from cellar to attic in dwellings which had already reached a state of dilapidation, were woefully lacking in sanitary facilities, and infested with rats and vermin. Many houses formerly occupied by one, two or three families were divided and subdivided again and again to become the homes for six, eight or ten families. It was not unusual to find one bathroom being used by twenty-five or thirty persons; rooms without windows used for bedrooms; no provisions made for the disposal of garbage or rubbish that was found in piles in cellars, yards or hallways; plumbing in such a state of disrepair as to be unusable; hazardous types of cooking and heating installations presenting possibilities of carbon monoxide poisoning; structural defects and lack of adequate exits presenting accident and fire hazards; and an abundance of bedbugs, roaches, and rats.

Every effort was made to give first attention to the reports of bad housing conditions received from health officers, public health nurses, social service units of hospitals, the City Welfare Department, the Buildings Engineer, and the Fire Department. Through the cooperation of the Baltimore Housing Authority, the War Housing Center, and the City Welfare Department homes have been found for a number of families living in houses posted by the City Health Department as unfit for habitation and to be vacated.

Although war conditions presented some difficulties to owners in getting a number of essential materials, cooperation was given by the War Production Board in meeting many urgent needs for improved sanitary housing. This has made possible the removal of a number of rat infested and defective frostproof hoppers, the all too common yard toilets, and the provision of inside toilets. Just a few significant figures may be mentioned here to show some of the results of the City Health Department efforts in the field of sanitary housing during 1943: Dwellings improved after notification, 257. Dwelling units improved, 1042. Dwellings posted as unfit and to be vacated, 94. Posted dwellings rehabilitated, 49. Frostproof yard hoppers removed, 189.

Though many difficulties have been encountered in developing the program of hygienic housing because of legal technicalities and enforcement delays, nevertheless much progress has been made. It is anticipated that during the coming months a great deal more will be done toward the eradication of slum housing in Baltimore, and particularly in the postwar period.

## NEWER POINTS OF ATTACK ON BALTIMORE'S VENEREAL DISEASE PROBLEM\*

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The venereal diseases are communicable diseases and in many respects an adequate control program should include the same principles so successfully applied in the control of other communicable diseases. The medical and allied professions must be active partners with any health department which hopes to attain good results in its venereal disease control program.

The annual report of the Baltimore City Health Department for the year 1865 included nineteen printed pages on constitutional syphilis. From that time until the establishment of the first venereal disease clinics in the Health Department in 1920 little was done. For the next eighteen years no phenomenal progress was made until Dr. Thomas Parran aroused the present day interest in the venereal diseases in 1936, and it is from this time on that I shall call attention to some of the outstanding activities of the Health Department referred to in the title as newer points of attack on Baltimore's venereal disease problem.

At a meeting of the Baltimore City Medical Society held at the Medical and Chirurgical Faculty building on February 5, 1937, a resolution was submitted by Dr. Joseph Earle Moore and adopted by the Society requesting the City Health Department to take such steps as would be practicable in organizing a campaign for the control of syphilis. The resolution pledged the members of the Society to cooperate with the Health Department in this important work and asked that the intimate relationship which now exists between the private physician and his patient be maintained to the fullest possible degree.

The next important step in the development of the Health Department's venereal disease control program was taken on January 24, 1938, when the consultants to the Department devoted a special meeting to a consideration of the problem of syphilis control. At this meeting the Commissioner of Health placed before the consultants a statement which he had prepared on the problem of syphilis control in the city. In it he reported that the syphilis situation in Baltimore was critical and urged that a complete reconsideration of the city's program for the control of syphilis was necessary, also that the new program should be of such character as to provide adequately for the needs of the situation and to insure results. Resolutions

\* Read at the meeting of the Baltimore City Medical Society, October 20, 1944.

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were adopted by the consultants approving the Commissioner's statement and a committee consisting of Dr. J. M. T. Finney, Dr. Allan W. Freeman, and Dr. J. M. H. Rowland was appointed to meet with the mayor on the matter of syphilis control. Within ten days following these resolutions by the consultants, the mayor of Baltimore announced his approval of this so-called new Baltimore plan for syphilis control and recommended appropriations adequate to meet the needs of the plan on a continuing basis. This was soon followed by the enlarged venereal disease control services at the new Druid Health Center where, for the first time, the Health Department was able to establish clinic facilities which could be considered as more or less adequate. The availability of treatment facilities, both public and private, is one of the basic principles of venereal disease control. Properly located, clean, well equipped and adequately staffed clinics held at convenient hours are essential for satisfactory diagnostic, therapeutic, and epidemiologic performance.

The activities of the Health Department along the lines of venereal disease control continued with little change until the entrance of the United States into the war when, just as in World War I, there was aroused a more intense public interest in the venereal diseases. The close association between Mars and Venus has existed since historians first recorded human annals. This increased emphasis placed on venereal disease control both by military and civilian interest was aroused as part of the battle against the avoidable disability and absenteeism so vitally affecting the war effort. From that time until the present day many frontal attacks have been made on this epidemic communicable disease which stands high in Health Department figures as a cause of morbidity and mortality.

Since early in 1941 there has been close personal contact between the City Health Department and the several commanding generals of the Third Service Command, first Gen. Walter S. Grant, then Gen. Henry C. Pratt, followed by Gen. Milton A. Reckord, and now Gen. Philip Hayes. Monthly meetings are held in the office of the Commissioner of Health in which the venereal disease control officer of the Third Service Command and the liaison officer of the United States Public Health Service meet with the officials of the Bureau of Venereal Diseases for the purpose of discussing problems of mutual interest affecting the armed services where the venereal diseases are concerned. These meetings are still a monthly event and have been of inestimable value in this phase of venereal disease control.

It was in part because of these meetings that the Baltimore Venereal Disease Council was organized under Civilian Mobilization Committee auspices. Its first meeting was held on January 7, 1943 at the Medical and Chirurgical Faculty building.

This new group came into being because it was felt that a modern attack



on the venereal diseases in any community is more than the task of its health department, its police department, its law, welfare, liquor control or recreation departments, or its courts or social organizations. It is the common task of all these agencies; indeed, of the community as a whole.

The membership of the Baltimore Venereal Disease Council includes a representative from the medical and pharmacy professions, the Army venereal disease control office, the City and State Health Departments, the Police and Welfare Departments, and the Board of Liquor License Commissioners. The chairman of the Baltimore Mobilization Committee attends the meetings and the Commissioner of Health has acted as chairman of the Council since its inception.

Shortly after its inauguration the Council developed three study committees, one on legislation, one on rehabilitation, and one on medicine, public health, and pharmacy. The Council will lend its efforts to assist the military authorities in their current venereal disease control program, but the major effort is directed toward a long range plan that will make the venereal disease record of Baltimore, which is a dark one, as much better as possible. Never before in the history of venereal disease control efforts in Baltimore has such a group of official and professional representatives sat around the table regularly to discuss how they may help each other and the community. The Committee on Medicine, Public Health and Pharmacy supported legislation introduced by the Maryland Pharmaceutical Association which on June 1, 1943 became a part of the Maryland state laws. This act makes it unlawful to advertise, sell, or dispense drugs or preparations for the treatment of venereal disease, except on the prescription of physicians.

In the matter of rehabilitation, the major advance has been the appointment in the City Department of Public Welfare of a new highly qualified person to serve as chief of the protective service for sexually promiscuous females. Through this new field worker important organizational relationships connected with venereal disease control already have been established with the State Women's Prison at Jessups, the Travellers' Aid Society, the United States Employment Service office in Baltimore, the Y.W.C.A., and other agencies. Studies are under way in connection with the need for specially trained policewomen and for a general educational program on venereal disease control especially directed to the promiscuous individual. The Department of Public Welfare is vitally concerned with a service which will reach out to the girl who can be assisted to a return as a self-respecting, noninfectious, useful citizen of the community.

The age old problem of sexual promiscuity complicates the control of the venereal diseases materially and the repression of prostitution should be considered as a public health issue. Baltimore is fortunate in not having

organized red-light districts, but, just as in other communities, there are those who facilitate the spread of venereal disease by rendering the place of procurement and the place of exposure readily available for the purpose of increasing their own ill-gotten gains.

Beginning on February 29, 1944, hearings for hotel, rooming house, and lodging house owners and managers have been held weekly in connection with their activities affecting the spread of venereal disease. Since then over fifty such establishments have been called into the Health Department to show cause why their housing permits should not be disapproved or revoked because of their participation in the spread of syphilis and gonorrhea among members of the Armed Forces and civilians engaged in the war effort. These hearings grew out of the series of conferences held at monthly intervals in the office of the Commissioner of Health, which were attended by the venereal disease control officer of the Third Service Command and the liaison officer of the United States Public Health Service attached to this Command. In this work the Police Department, the Sanitary Section of the Health Department, and the Bureau of Venereal Diseases have worked as teammates in the enforcement of the rooming house ordinance in the City Housing Code. Active assistance is being rendered in these efforts by the Maryland Hotel Men's Association.

In the past twelve months there has been considerable activity in the venereal disease control program in Baltimore. A number of the lay social investigators in the Health Department have been replaced by public health nurse investigators, the caliber of whose epidemiologic activities is universally admitted to be superior to that of the lay workers.

On May 8, 1944 the first venereal disease clinic was held in the new Somerset Health Center located at Orleans Street and Central Avenue in the Eastern Health District of Baltimore. Here medical, clinic, and public health nursing services for the Negro population in the eastern portion of the city will be available and the venereal disease clinic service rendered more adequate in this section of the city. Public health nurses on the City Health Department staff have been trained to administer intravenous therapy in the clinics. Much of the clinic physicians' time need no longer be devoted to the routine administration of drugs and he can take a more active interest in diagnosis, epidemiology, and the educational aspects of his clinic performance.

On September 25, 1944 the first two Negro clinic physicians on the Health Department staff were assigned to work in the syphilis department of the Johns Hopkins Hospital. This postgraduate training for the Health Department clinic personnel should be of great value in maintaining high standards in the Health Department clinics.

The plans of the Department of Public Welfare are to be realized with the

establishment of a venereal disease division at the Baltimore City Hospitals with the cooperation of the United States Public Health Service. A total of seventy beds are to be provided in the white and Negro sections of the new division and an allotment of \$30,000 has been made by the federal government out of Lanham Act Funds to cover some of the expenses of maintaining the new division. A staff doctor and a head nurse will be assigned to the venereal disease ward by the Public Health Service. Admissions will be handled by the City Health Department. This division will provide quarters in which cases of infectious syphilis and gonorrhea will be quarantined and treated, to be released only after they are no longer a danger to the community as sources of infection of the venereal diseases.

Plans are under way for the development of an active venereal disease educational program as an essential feature of a well organized venereal disease control program. In addition, there is considerable interest today in the relationship of the venereal diseases to industry. Indiscriminate denial of employment to all persons with venereal disease cannot be too strongly condemned. It is generally agreed that a more rational and medically sound policy is the exclusion from hazardous occupations by individual selection of those who have cardiovascular or central nervous system syphilis or those who are otherwise physically unfit for their jobs. The use of the serologic test for syphilis as a basis for denial of employment is unsound and unnecessary. This is the lesson the Health Department is attempting to teach industry in Baltimore. Good progress is being made with individual companies but the educational process is a long and difficult one. Unfortunately, at times the company physician is not the easiest person to convince that good public health and medical practice is to examine, diagnose, and treat the employee, if necessary, and not summarily to dismiss him on the basis of a single positive serologic test for syphilis or an undiagnosed discharge.

In closing I should like to call attention to the extremely important part which must be played by the medical and allied professions in the organization of a venereal disease control program. The control of these diseases, in great measure, will depend upon how well the medical profession is informed and trained in its management. A health department cannot hope to develop an effective program without the active support and full participation of the physicians in the community. A program of medical information and education, including instruction in the medical schools, in the public health aspects of venereal disease control and postgraduate instruction of practicing physicians must be an integral part in any adequate health department control program.

Much progress has been made but a great deal remains to be done. The Health Department clinics which are held in the basement of the Municipal

Building and at 28 South Broadway are in great need of being relocated so that their diagnostic and epidemiologic performance may be improved. There is a need for increased health department clinic service to both white and Negro patients. Venereal disease clinic services are contemplated in the proposed Southern Health District building, funds for which are included in the budget submitted by the Commissioner of Health for 1945. There is a possibility that clinic facilities will be available in the new Health Department building planned by the municipal authorities in the postwar construction program for Baltimore.

As a part of the long range program under consideration by the Health Department much thought is being concentrated on the establishment of a better integrated city-wide program for the control of the venereal diseases, as well as a widespread educational endeavor to reach both lay and professional groups. The cooperation of church and school authorities must be had in a program of health information designed toward the spread of all the facts necessary to prevent these diseases.

We have come a long way since Ehrlich discovered salvarsan. The newer methods of accelerated treatment, the use of the sulfa drugs, and now the use of penicillin are all part of a constantly changing picture in the therapy of the venereal diseases. It is only through the combined efforts of the entire community that the future is dimly lighted with a small gleam of encouragement.



## HYPERTHYROIDISM AND THIOURACIL\*†

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The use of thiouracil‡ in the management of the patient with thyrotoxicosis has stimulated a great amount of interest and many reports have been published during the past year concerning its usefulness and its liabilities. A preliminary report from this department was published one year ago and the present paper is intended only as a progress note on the clinical results obtained at the University Hospital during the past year and includes no attempt to review the literature or to compare the results of treatment with those obtained elsewhere.

Although over 100 patients have been treated with thiouracil, the conclusions to be presented are based upon fifty cases. Each of these has either been under treatment for a period greater than one year or treatment has been terminated in less time because of operation or because of sustained remission of the signs and symptoms. With the exception of the case to be reported because of its fatality, each of the cases considered here had pretreatment basal metabolic rates ranging between +40 and +120 per cent and was definitely thyrotoxic. No patient with masked or atypical hyperthyroidism is included.

The method of treatment now in use is essentially the same for each patient. From 0.6 to 0.8 Gm. of thiouracil is given in 0.1 Gm. doses over a twenty-four hour period for the first three or four days; the dose is then gradually decreased to 0.4 Gm. daily (8 A.M., 12:00 M., 4:00 P.M., 8:00 P.M.) until the basal metabolic rate is within normal limits. The patient is discharged on a maintenance dose of 0.3 Gm. per day and this quantity is reduced gradually according to the rate of fall in the basal metabolic rate determined on subsequent weekly visits.

In patients not to be discharged on a maintenance routine, operation is planned when the basal metabolic rate reaches a level approximately one-third to one-half of the highest pretreatment figure. It has not been found necessary to depress the metabolism to a  $\pm 10$  range.

In a case of mildly toxic nodular goiter the initial daily dose of thiouracil is usually 0.4 Gm. for the first two weeks and subsequently is reduced to the maintenance dose. There is clinical evidence to support the belief that the dose of thiouracil must be adequate to achieve any beneficial result, but

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†Received for publication November 30, 1944.

‡The thiouracil was supplied by the Lederle Laboratories, Inc., Pearl River, N. Y.

adverse reactions are more common in the patient who is receiving the drug in excess of the amount needed.

Adjunctive therapy consists of  $\frac{1}{2}$  gr. of phenobarbital for the first three days and then  $\frac{1}{4}$  gr. of phenobarbital with each dose of thiouracil. Sodium bicarbonate is prescribed if crystalluria develops. A multivitamin preparation is given initially three times a day and then once daily after the maintenance dose of thiouracil is established. A ferrated liver concentrate is administered to each patient unless the white blood cell count presents no abnormality and the hemoglobin is in excess of 14.0 Gm.

From  $\frac{1}{320}$  gr. to  $\frac{1}{160}$  gr. of thyroxin or 1 gr. of desiccated thyroid is given two to four times a day, depending on the severity of the ophthalmopathy. The patients intended for surgery receive thyroxin for one of two reasons: 1) if the thyroid is enlarged and giving pressure symptoms; or 2) if the eyes present conjunctival hyperemia or signs of increased intra-orbital pressure after thiouracil treatment has been started. In addition, although the experimental evidence is not yet conclusive, it is believed that desiccated thyroid or thyroxin administered preoperatively tends to make the gland firmer and less vascular.

There is a natural division of these hyperthyroid patients into two groups:

A. Cases prepared for surgery:

1. Toxic nodular goiter with certain exceptions to be described later.
2. Thyrotoxicosis with a history of a large colloid goiter before the advent of the toxic state.
3. Persons living too far away to be checked at weekly or bimonthly intervals.
4. Patients lacking sufficient intelligence or perseverance to adhere to a prescribed routine without supervision. This group includes children and adolescents, unless the parents are unusually cooperative.
5. Those who prefer thyroidectomy rather than medical management for economic reasons or because of the time factor.

B. Cases controlled by medical management:

1. Hyperthyroidism with diffuse hyperplasia.
2. Toxic nodular goiter in elderly patients or in those not considered to be good risks for operation because of a concomitant disorder.
3. Special cases where there is suspected a precipitating or causative factor, such as pregnancy, tonsillitis, sinusitis, or a similar infection.
4. Patients presenting evidence of definite ophthalmopathy, such as a pronounced stare or exophthalmos.
5. Persons on whom there have been one or more thyroidectomies performed with poor response.

This is a general divisional plan because there is obviously some overlapping between the groups; a patient may start as B-2 and end as A-1, or he may change his status from B-5 to A-1.

Particular interest has been aroused by the patients belonging to group B, because through their reactions under treatment valuable information can be obtained and applied toward a further understanding of the physiology of hyperthyroidism. The results of treatment in these cases over a long period of time have furnished the material for much of this paper.

It is the general consensus of most investigators that thiouracil is a useful drug and is superior to iodine in the preoperative preparation of the patient, because when the thiouracil-prepared patient comes to surgery he is less toxic and also seems to show less tendency to postoperative complications peculiar to the thyroid patient. The time required for preparation is essentially the same with the two methods; possibly thiouracil requires a shorter period. Just as there are exceptional patients who are refractory to iodine but respond to thiouracil, there are probably a number who benefit only from iodine. However, there have been no such patients in this series with the exception of one who was unable to take thiouracil because the drug caused a morbilliform rash and fever on the two occasions when it was administered. There have been several cases of drug hypersensitivity in the present series but this was the only instance of drug intolerance.

Thiouracil presents two important liabilities, the most serious being its tendency to cause granulocytopenia. The other disadvantage is the troublesome though not dangerous vascularity of the gland when it comes to surgery. There are some who feel that iodine administered concurrently with thiouracil helps to decrease this vascularity. However, in six cases so prepared at the University Hospital no great difference was noted preoperatively in the laboratory studies concerned with bleeding and little variation was seen at the time of operation in the appearance or character of the gland.

Investigators are less in agreement over the question of whether thiouracil should be used as a substitute for thyroidectomy. Although more time must elapse before definite statements can be made because it is still too early to interpret with certainty the findings in prolonged medical management, a summary of the cases in group B is encouraging to the clinician. In those patients who have received thiouracil for a year or more there have been no apparent deleterious effects.

*Cases in group B-1:* Four of the six patients in this group received thiouracil for periods ranging from four to nine months before the drug finally was discontinued. The basal metabolic rates have been normal for the past six months and all of the patients were free of the signs of thyrotoxicosis. They gained weight, had normal pulse rates, and were able to live normal lives as far as eating, sleeping, and efficiency in work were concerned. The results shown in figure 1 are typical of these six cases.

However, in three of the patients a hyperthyroid personality remains.

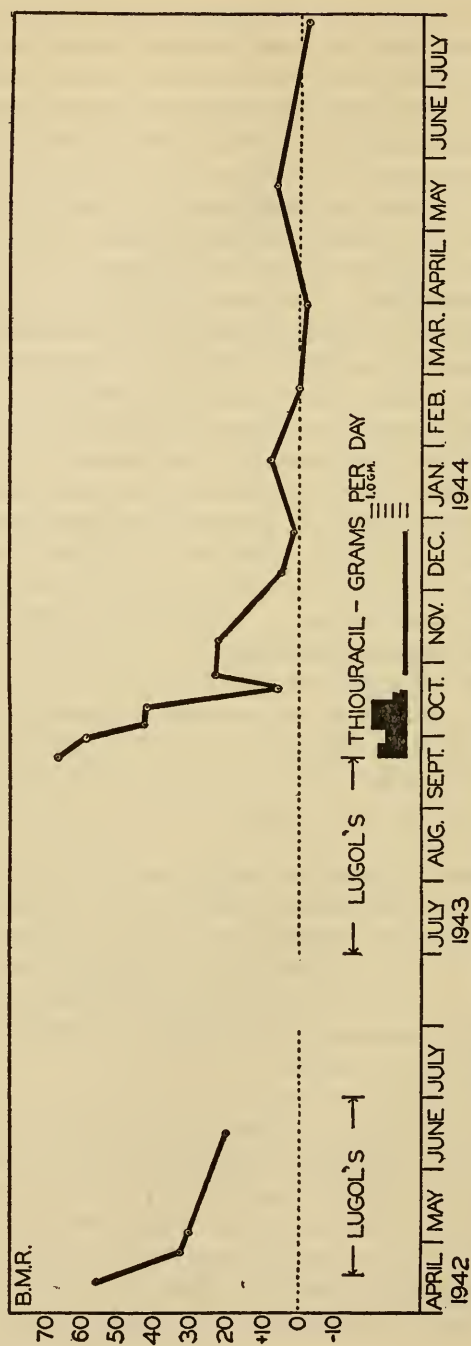


FIG. 1. Average response of uncomplicated hyperthyroidism with diffuse hyperplasia.



These three had unstable vascular systems and neurocirculatory asthenia. At the moment each is at a loss for some definite physical defect to explain his functional symptoms. The ages of these patients are between twenty and forty years. The previous thyrotoxicosis had been of from one to three years' duration before treatment and the average pretreatment basal metabolic rate of this group was +46 per cent. It is probable that the hyperthyroid emotional and vascular instability which persists in these cases in spite of the low basal metabolic rates would have been equally unaffected by surgical treatment.

*Cases in group B-2:* There have been no cases thus far in which a patient with a nodular thyroid has become remissive for more than four months after treatment with thiouracil has been discontinued. All with nodular goiter are now prepared for operation with the exception of elderly patients with long-standing parenchymatous visceral damage such as thyrocardiac failure, or those with advanced tuberculosis or carcinoma not of the thyroid. Because nodular toxic goiter responds so satisfactorily to treatment with thiouracil there are only four cases in this group.

*Cases in group B-3:* Three patients have become thyrotoxic during pregnancy. In two, thiouracil was discontinued at the time of delivery or during the ninth month. One patient in her sixth month postpartum had a basal metabolic rate of +10 per cent; the second in her fourth month postpartum had a basal metabolic rate of +16 per cent. Neither presented signs of thyrotoxicosis. The infants, who had been exposed to thiouracil for four and three months antepartum respectively, appeared to be normal. The third patient received thiouracil from the end of her sixth month to three weeks before delivery, during which time the basal metabolic rate fell from +59 per cent to +10 per cent. Four months after delivery the basal metabolic rate was +46 per cent and the patient was beginning to show a return of thyrotoxic symptoms. Treatment with thiouracil has not yet been started since the weight and pulse are normal; however, this patient will probably require thiouracil and surgical treatment because a nodule measuring three centimeters is present in the right lobe of the thyroid gland.

Two patients with tonsillitis were admitted for the treatment of hyperthyroidism. On admission the basal metabolic rate of one patient was +57 per cent; it could not be determined on the other patient because she was extremely ill, but it was found to be +55 per cent after two weeks of bed rest and treatment with iodine. Tonsillectomy was performed in each case after two months of treatment with thiouracil. The basal metabolic rates have remained normal in the past six months, with no further need of medication.

In one case of thyrotoxicosis with nodular goiter and chronic tonsillitis, thiouracil was administered until a tonsillectomy could be performed; this patient later required a partial thyroidectomy.

*Cases in group B-4:* Two cases presenting moderate ophthalmopathy were referred for operation. In one the goiter was nodular and unusually large, the gross weight of the specimen removed being 185 Gm. The basal metabolic rate was +116 per cent before treatment, and the danger of progressive ophthalmopathy seemed less than the risk of hyperthyroidism. If she had been discharged on a medical routine the treatment would have been poorly controlled because she lived in a distant community with no laboratory facilities. The exophthalmos has not been progressive; both the operation and postoperative course have been satisfactory.

In the other case a mildly toxic nodular goiter was present. The basal metabolic rate was +20 per cent before treatment and +3 per cent at the time of operation. The patient had a moderate exophthalmos which would ordinarily be regarded as contraindicating operation. In addition, the basal metabolic rate of +20 per cent was considered to be physiologic for the amount of her obesity. She was referred for operation only because of pain in the region of the thyroid. The operation was uneventful, but as she was moved from the operating table to her bed respirations ceased and an emergency tracheotomy was required. Immediately after the operation she developed a fulminating exophthalmos and signs of an acute thyroid course. Exitus was made forty-eight hours later with a temperature of 108 F. This patient, through error, received sodium iodide intravenously at the time of operation; however, it is not probable that this contributed to her death. Postoperative treatment with massive intravenous doses of sodium iodide and sodium sulfadiazine was of no avail. Incidentally, at autopsy the patient was found to have active aortitis. This may have been a factor in causing the pain referred to the thyroid gland.

In the series of patients with exophthalmos and hyperthyroidism there are nine who are now being controlled by thiouracil and thyroxin. Each is able to lead a normal life if the basal metabolic rate is maintained at a level ranging between +15 and +25 per cent. Below +15 per cent the exophthalmos becomes troublesome; above +30 per cent there is evidence of thyrotoxicosis. Four patients of this group have received thiouracil for a year or more and apparently have suffered no ill effects from prolonged treatment.

*Cases in group B-5:* In this group were four patients who had two or more thyroidectomies. Two will eventually return for surgical treatment because they present the nodular thyroid glands that would require prolonged if not continuous treatment with thiouracil. The other two preferred to remain on a medical routine and are now checked at monthly intervals. Both of these have moderately advanced exophthalmos and no attempt has been made to cease thiouracil-thyroxin treatment. Except when an upper respiratory infection supervenes, the thyroid gland is not palpable. The eyes are of almost normal size; the patients look and feel well.

## SUMMARY AND CONCLUSIONS

It would appear from an analysis of the cases thus far studied that the thyroid gland reacts to a disturbance elsewhere in the body by hyperfunction in the case of Graves' disease with diffuse thyroid enlargement. If these cases can be carried through the acute period with thiouracil and the exciting factor corrected, e.g., by tonsillectomy, physiologic termination of pregnancy, or by some similar specific procedure, operation may be avoided. However, in nodular goiter with toxic signs the thyroid gland itself is probably intrinsically at fault even though the nodular state may represent an advanced degree of deformity caused by earlier recurrent states of hyperplasia. In reviewing the cases of nodular goiter in this series it has been found that operation is inevitable if the patient does not wish to continue thiouracil therapy indefinitely, but the reversion to a normal state of endocrine balance is more easily accomplished and more readily maintained with thiouracil than with iodine.

In treating a case of hyperthyroidism preoperatively the choice of methods would appear to be in favor of thiouracil because the treatment is more controlled, there is less fluctuation in the response of the patient, and because the patient is less toxic and therefore a better candidate for surgery, being less susceptible to the postoperative complications peculiar to hyperthyroid patients. However, the clinician must check the blood count of the patient on thiouracil therapy at least twice a week during this period and at operation the surgeon must contend with increased vascularity in the gland.

The administration of iodine before thiouracil delays the effect of thiouracil in lowering the basal metabolic rate because of the increased iodine storage in the gland which must be exhausted before the effect of thiouracil on the basal metabolic rate is noted. However, the feeling of well-being appears during the first week of thiouracil therapy and thus would seem to be independent of the basal metabolic rate.

The administration of iodine along with thiouracil has no effect on the thiouracil influence and is probably a waste of iodine solution. The action of thiouracil is probably achieved by causing a refractoriness to the uptake of iodine and to the consequent synthesis of effective hormone in the thyroid gland. Experience with this series thus far in using iodine and thiouracil concurrently has not shown iodine to be effective in any way. The administration of either thyroxin or desiccated thyroid along with thiouracil probably causes the gland to become less vascular, firmer in consistency, and more easily handled. At the same time, effective thyroid hormone is furnished to meet the requirements of other important end organs such as the eye, and to help maintain general water balance.

In the case of the thiouracil patient no postoperative medication is re-



quired other than the usual sedation and analgesia, and in some instances blood transfusion.

There have been fewer toxic reactions to thiouracil in this series than would be expected according to reports in the literature. The reasons for this may be careful surveillance of the patients so that anticipated complications do not arise, fortunate but unequal selection of thyrotoxic patients, and the administration of cevitic acid and liver concentrates routinely to all persons receiving thiouracil.

The use of thiouracil is either not advisable or is contraindicated in the following cases:

1. Patients who have on at least two occasions exhibited hypersensitivity or intolerance to the drug in the form of rash, fever, or a persistent fall in granulocytes.
2. Those who are not definitely thyrotoxic and in whom a therapeutic response to iodine is necessary to establish the diagnosis of hyperthyroidism.
3. Persons who are admitted for an emergency surgical or medical condition and in whom a thyrotoxic state suddenly supervenes.
4. In many cases of cardiac or renal insufficiency where a moderately high basal metabolic rate is found by routine test and where there is no other evidence of thyrotoxicosis. In conditions such as lymphatic leukemia and cardiorenal disease the elevated basal metabolic rate is probably a physiologic compensatory mechanism. In these conditions thiouracil either has no effect on the basal metabolic rate or brings about no feeling of increased well-being in the patient who reacts with a lowered metabolism.
5. Instances of genuine thyrotoxicosis if the patient cannot be observed at weekly intervals.

The use of thiouracil is not contraindicated in the following conditions if the thyrotoxic state requires treatment:

1. Patients with a normally low white blood cell count, such as 3500, if the differential is normal.
2. Those with a single remaining kidney, chronic nephritis, or a history of sulfonamide intolerance.
3. Infections and other conditions requiring sulfonamide therapy. There has been no incidence thus far of drug incompatibilities.
4. Pregnancy. Thus far three cases have been treated during the last two or three months of pregnancy. The effect on the infant does not appear to have been adverse. During the last six weeks of pregnancy an effort has been made to obtain weekly basal metabolic rate determinations in order that the rate would not be depressed below +10 per cent.



## AN OBSTETRIC CASE HISTORY\*†

### CASE REPORT

The patient was a nineteen year old primigravida whose family and past histories were negative. Her last menstrual period was October 6; the estimated date of confinement was July 13.

She was first seen on January 10, at which time her physical examination was negative; the pelvic measurements were adequate; pelvic examination was negative, except for the pregnancy of twelve weeks. The weight of the patient was 118 pounds. Her blood pressure was 110 mm. of mercury systolic and 70 mm. diastolic. On subsequent visits her condition was found to be normal and on June 20, the thirty-sixth week of gestation, her weight was 137 pounds, with blood pressure of 114 mm. of mercury systolic and 76 mm. diastolic. One week later, June 27, her weight was 142 pounds, a gain of five pounds, the blood pressure was 126 mm. of mercury systolic and 84 mm. diastolic, and the urinalysis was negative. Appropriate therapy was prescribed and on July 3 the weight was found to be the same as on the previous visit; however, the blood pressure had risen to 140 mm. of mercury systolic and 90 mm. diastolic. The urinalysis showed 1 plus albumin. She complained of occasional headaches and there was some edema of the hands and feet.

The patient was admitted to the hospital the same day and proper therapy was instituted. For the first twenty-four hours the blood pressure gradually rose to a level of 160 mm. of mercury systolic and 110 mm. diastolic, and there was increasing albuminuria. During the next two days the blood pressure showed a tendency to decrease, became stabilized, and on occasion was as low as 126 mm. of mercury systolic and 90 mm. diastolic. The albuminuria and edema were reduced and there were no headaches. A steady and gradual improvement was noted. A rectal examination at this time revealed the cervix to be soft and the os dilated 2 cm. The presenting part, the occiput, was 1 cm. below the spines.

*Treatment:* The problem presented here requires the institution of a program of therapy for the patient beginning June 27 at home, later in the hospital, and also postpartum.

### DISCUSSION

The patient first showed evidence of approaching toxemia on June 27, when there was a gain of five pounds in one week and slight elevation of the blood pressure. Although her blood pressure was still within normal limits she should then have been placed on a salt-free diet, with no restriction as to the types of foods to be eaten, an increase in the sugar content of the diet, but no change in the protein elements. Mild sedation, such as the administration of phenobarbital, was indicated, accompanied by increased bed rest and limitation of her work. Usually in these cases fluids are not restricted but some obstetricians feel that this should be done, especially in the presence of edema. The patient should be instructed to notify her physician of headache, epigastric pain, edema of the extremities or face, and

\* From the Department of Obstetrics, School of Medicine, University of Maryland.

† Received for publication November 29, 1944.

dizziness. These are precursors of convulsions and she should be seen again within a week.

It was found advisable to admit the patient to the hospital because of the increasing severity of the signs and symptoms. Complete bed rest was ordered with intravenous administrations of 250 cc. of 20 to 25 per cent glucose every four hours, frequent blood pressure recordings, and mild to heavy sedation depending on the severity of the toxemia. The sedation under such conditions may range from small doses of phenobarbital to 6 drams of paraldehyde given orally or 8 to 12 drams rectally. The patient received this therapy, after which her blood pressure became lower and the other symptoms disappeared. After several days' treatment her condition was stabilized, the blood pressure had a tendency to decrease, there was less albuminuria, and no symptoms were present. Under these conditions the patient should be delivered because of the danger of recurrent symptoms. Furthermore, the longer the toxemia exists, the greater is the danger of permanent damage to the kidneys and the arteriolar tree.

This patient was in satisfactory condition for delivery through the vagina as shown by the rectal examination. A medical induction was given but this was not successful. The membranes were ruptured and she went into labor. During this time she was given paraldehyde sedation and intravenous glucose, and frequent blood pressure recordings were made. Both labor and delivery were uneventful and the patient was discharged on her tenth day postpartum with a blood pressure reading of 120 mm. of mercury systolic and 80 mm. diastolic, and no albuminuria. A follow-up at six weeks and another six months later showed her condition to be normal.

## MONTHLY MEETINGS OF THE UNIVERSITY HOSPITAL STAFF

### CAVERNOUS SINUS THROMBOSIS AS A COMPLICATION OF ADENOTONSILLECTOMY\*†

#### REPORT OF A CASE

SAMUEL L. FOX, M.D. AND G. BROOKS WEST, JR., M.D.

Though cavernous sinus thrombosis is not common, it is not sufficiently rare to warrant reporting a single case unless it possesses some unusual aspects. The case about to be reported presents an unusual pathogenesis, and therefore deserves consideration.

The cavernous sinus thrombosis occurring as a complication of infections about the upper lip, nose or eyelids is well known. Few cases are seen from other causes. However, there are four recognized routes of infection:

1. Anterior foci. Such infections result from suppurations of the upper lip, ala nasi, vestibule of the nose, and eyelids, and spread by way of the angular, supra-orbital and supratrochlear veins to the ophthalmic veins.

2. Internal foci. These infections occur as a result of intranasal operations on the septum, turbinates, and sinuses; after the use of the actual cautery in the nose during the stage of acute infections; and from suppuration of the posterior ethmoid and sphenoid sinuses, rarely the antra. The infection is spread through the ethmoidal veins or through the wall of the sphenoid sinus directly.

3. Inferior foci. Such infections develop from peritonsillar abscess, operations on the tonsil, operations upon and osteomyelitis of the superior maxilla, and deep cervical abscess. They spread by way of the pterygoid plexus or by direct proximal (retrograde) extension of the internal jugular vein through the lateral sinus and the petrosal sinuses.

4. Posterior foci. These infections occur as a result of extensive involvement of the middle ear and mastoid, with lateral sinus phlebitis or thrombosis, and spread in a retrograde manner through the petrosal sinuses to the cavernous sinus.

Anatomically the cavernous sinuses are divided by numerous fine trabeculae, so that blood stasis and thrombosis occur readily. Also, the cavernous sinuses are connected with each other by the anterior and posterior basilar sinuses, which are situated on the floor of the sella tursica under the pituitary body. This explains the almost universal bilateral involvement that occurs when either cavernous sinus becomes infected.

\* From the Department of Rhinology and Laryngology, School of Medicine, University of Maryland.

† Read before the monthly meeting of the University Hospital Staff, October 19, 1944.

The *onset* of cavernous sinus thrombosis is usually manifested by a severe chill, a high fever ranging from 102 to 105 F., extreme toxicity, and perhaps nausea and vomiting. There is headache, but the patient is mentally alert until meningeal involvement occurs. The first localizing sign is definite edema of the bulbar conjunctiva and chemosis of the eyelids, with rapidly progressive exophthalmos of the eye on the affected side, but soon becoming bilateral. There is also limitation of movement of the eye caused by abducens or sixth nerve paralysis, with concomitant alterations in the sizes of the two pupils. Meningitis usually occurs rather early, after which the sensorium is affected to a considerable degree. A fundal examination reveals dilatation of the retinal veins but rarely papilledema. There may be some swelling in the region of the mastoid on the affected side, owing to the exit in this region of an emissary vein in connection with the sinuses that communicate with the cavernous sinuses.

The *diagnosis* of cavernous sinus thrombosis is not difficult. The acute onset, extreme toxicity, sustained high fever, and the characteristic eye findings are classic signs of the disease. It must be differentiated from lateral sinus thrombosis, which it may complicate. In lateral sinus thrombosis the onset is gradual and almost always follows a middle ear or mastoid infection, or an infection in the neck. The fever is intermittent and the temperature chart is typical, with extreme elevations associated with chills followed by remissions to normal. The blood culture is usually positive in thrombosis of either blood sinus.

The *treatment* is purely medical. Surgery is only indicated at the site of the origin of the infection to eradicate the focus. The *prognosis* is still grave, in spite of sulfonamide and penicillin therapy. Death may take place in from forty-eight hours to ten days.

#### REPORT OF A CASE

M. J. H., an 8 year old white female, was admitted to the South Baltimore General Hospital on August 4, 1944 because of headache of three days' duration, high fever, and extreme toxicity.

The past history was entirely negative, except for a bilateral chronic otitis media. The patient had recently been advised to have a tonsillectomy and adenoidectomy because of an exacerbation of the otorrhea. On July 21, 1944 these surgical procedures were carried out under gas and ether anesthesia in the usual way. The postoperative course was normal. The child was seen in the outpatient clinic on July 28 and discharged to return to school. On August 4 she was brought back to the outpatient clinic in obvious toxemia, with a temperature of 104 F. The patient was mentally clear and there were no localizing signs. The throat had not yet healed and there was some postnasal purulent discharge on the postpharynx. Admission to the hospital was advised.

A physical examination on the ward several hours later revealed a toxic and irrational child with a temperature of 106 F. There was inequality of the pupils, the right one being larger than the left, but both reacted to light. There was some sour smelling discharge in each ear canal, but no tenderness or edema over either mastoid. The remainder of the physical examination was negative.



Urinalysis was negative except for a trace of albumin. The red blood cell count was 3,170,000; there were 13,550 white blood cells, with polymorphonuclears 92%, lymphocytes 5%, and monocytes 3%; the hemoglobin was 66%. The sedimentation rate was 18 millimeters. The blood sugar level was 188 mg.% after 1000 cc. of 5% glucose had been administered intravenously. The nonprotein nitrogen level was 50 mg. %.

The spinal fluid examination revealed a pressure of 130 mm. of water, no cells, and 13 mg. of protein. A roentgenogram of the chest showed the heart and lungs to be normal. Upon roentgen ray examination of the mastoids an undeveloped cell structure was found on either side, with no evidence of bone destruction.

About six hours after admission there developed a definite exophthalmos with lateral rectus paralysis on the right side, and the patient became deeply stuporous. The findings of a fundal examination were negative. In spite of 1.0 Gm. of sodium sulfadiazin administered intravenously every four hours since admission, and 50,000 units of penicillin at the first signs of exophthalmos and 10,000 units every four hours thereafter, the child died at 12:40 A.M. on August 6, 1944. The exophthalmos remained unilateral throughout.

The following are abstracts of papers presented at the monthly meeting of the University Hospital staff held on November 16, 1944.

#### TREATMENT OF A PROBLEM CHILD\*

A. J. ROCKWELL, Ph.D.

A case was presented to show the child guidance clinic approach to treatment of a child with personality and behavior disorders. The patient, a boy of four years and ten months, was at the time of referral intensely hyperactive, cruel, and destructive, and was stealing from home and lying. The treatment of mother and child was described.

#### A CASE OF PSYCHOGENIC ASTHMA†

HANS W. LOEWALD, M.D.

A case of psychogenic asthma in a nineteen year old girl was presented. An extremely destructive family background caused the patient to develop a great amount of resentment and hostility, as well as suspiciousness bordering on paranoidism. Psychiatric interviews helped her to express some of these feelings which had constantly been suppressed by the patient, and lead to an improvement of her asthma.

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\* From the Department of Psychiatry, School of Medicine, University of Maryland.

† From the Department of Psychiatry, School of Medicine, University of Maryland.

## COMMENCEMENT ADDRESS\*

MAJOR GEN. NORMAN T. KIRK, M.C., U.S.A.†

It is indeed a great honor and privilege to come here to talk to you men and women who are graduating today from the University of Maryland. I know that those of you in the Army Specialized Training Program, as well as the others of the class who are not in the military forces, have worked hard and diligently to do this job in the short period of three years which ordinarily requires four. Your presence in this graduating class is proof in itself that you have accomplished this difficult mission.

You have now become alumni of the University of Maryland and I know you have just reason, as I have, to be proud to be an alumnus of this grand School of Medicine whose alumni have made brilliant records in time of peace, in World War I, and are now making outstanding contributions to the war effort in World War II.

I know you are proud of the two affiliated units of the University of Maryland, the 42nd and the 142nd General Hospitals, which have been serving for over two years in the Southwest Pacific Area. The officers and nurses of the units which came from this School have rendered outstanding service to their country in the heat and discomforts of the tropics, without complaint. Your Professor of Medicine, who went out in command of one of these units, is now Medical Consultant to the Surgeon of that Theater and in this capacity is rendering excellent service to the nation and to our Army there. Many other alumni of this School are serving in the Medical Corps of the Army throughout the world. I saw them in North Africa and Italy, in England and France.

General Fred W. Rankin, who is Chief Surgical Consultant to the Army in my office is, as you know, a distinguished and honored graduate of this school. Colonel W. Lee Hart, Surgeon of the Eighth Service Command, and Colonel Frank W. Wilson and Colonel E. L. Cook, who each command a general hospital here in the United States, are also graduates.

Your present Professor of Surgery was decorated for the meritorious service he rendered with a mobile hospital in France in World War I. Your distinguished Dean was Surgeon General of the Army before his retirement to civil life. Major General Robert H. Mills, who heads the Army Dental Service in the Surgeon General's Office, is a graduate of the School of Dentistry of this University.

\* Given at the Commencement Exercises of the University of Maryland School of Medicine and College of Physicians and Surgeons, and the University of Maryland School of Nursing. The Lyric, Baltimore, September 29, 1944.

† Surgeon General, U. S. Army.

I am sure that at least one-half of your normal faculty is now serving with the Armed Forces. As you now become alumni of this great School, its wonderful record is your heritage to uphold and improve.

Those of you wearing the uniform have nine months to serve before you complete your internship. We hope by then that the war with Germany will have long since been successfully completed, but we will still have a war to wage and win in the Pacific, and after that the Medical Department will have the problem of the treatment and rehabilitation of our battle casualties and casual sick who have been brought back from overseas to our general hospitals here at home. This will last many, many months after the war has been ended and will afford to those of you who are so fortunate as to be so assigned an excellent graduate course in medicine and surgery. Many medical officers will be required to staff our armies of occupation after total victory.

Under the present 9-9-9 system of internship your period of hospital work is decreased in time, but due to the limited number of interns and residents available in civilian hospitals I am sure that the work you will have to do will be greater than that of the interns who preceded you and you will probably have an opportunity to do more than they were permitted by their residents to do.

When you join the military forces you will find the American soldier an ideal patient. His spirit is wonderful! He does not ask for sympathy or favors and is frequently more concerned about his "buddy" than he is about himself. He may have lost an arm, a leg, an eye, or have nonunion in a compound fracture, but he has accepted this and expresses by his attitude his complete confidence in his doctor and his firm belief that he will soon be well. You will see this spirit in battle casualties in our general hospitals here at home and in any theater that you visit overseas. Robert Littell well expressed it in his description of an LST acting as a hospital carrier, loaded with battle casualties returning from Normandy across the English Channel, when he said this was a "cargo of pain and courage."

It is not surprising that these men present this spirit. They were when wounded American soldiers, tough, hardened, resourceful, self reliant and self confident, developed through training and leadership. They were soldiers who could give and take and lick the best the enemy could offer. They were, in other words, courageous physically and mentally fit men.

This spirit must be maintained as it has been maintained by the care that has been given our battle casualties and our casual sick in all theaters. These patients are high in their praise of the medical aid men who accompanied them and rendered medical aid in combat, of the nurses who cared for them—at times under shell fire—and of the medical officers who treated their wounds.

Blood plasma has saved many lives which otherwise would have been lost from shock. The sulfa drugs and penicillin have lessened infection in wounds. But excellent primary surgery has been the greatest single factor in the successful care of the wounded.

The plan of the medical service in the combat zone is based upon the principle well learned in the last war, the sooner the wounded soldier can receive proper surgery the better are his chances for recovery with the minimum of disability. To implement this principle the Army is using highly mobile surgical teams composed of excellently trained surgeons, nurses, and Medical Department enlisted men to supplement field hospital platoons and evacuation hospitals in the forward areas. Rapid evacuation by litter carry, by motor ambulance, by air, and by hospital train and ship likewise plays its part.

When primary surgery is performed, and it is indicated in all battle casualties, devitalized, traumatized tissue is removed along with foreign bodies, all deep fascia spaces are opened, no wounds are closed but are dressed loosely with vaseline gauze and, if it be an extremity with a complicating fracture, it is immobilized in a padded plaster cast for transportation.

New surgical technics made possible by penicillin, sulfa drugs, and whole blood transfusion in our general hospitals overseas, grouped under the term "reparative surgery," have been designed to prevent infection before it is established or to cut it short at the period of its inception. Once established, wound infection is destructive to tissue and, at times, to life. It may permanently preclude the restoration of body function. Wounds are closed, under this method of management, on the fourth to tenth day, frequently when the first dressing is done. If a closure of a large skin defect cannot be effected by this method, the area is skin grafted.

Compound fractures, of which there are many, are thus converted into simple fractures; soft tissue wounds are soon healed, permitting the early return of the soldier to duty. Open thoracotomies are performed from the first to the tenth week for the removal of organized hemothorax. The lung is decorticated and expanded to normal by positive intratracheal pressure. Penicillin is placed in the pleural cavity and the chest wall closed. Contracted, fixed lung with fixed, displaced mediastinum, and chronic suppurative empyema with long hospitalization and invalidism are thereby prevented. After this procedure the soldier is soon well and can be returned to his organization in the theater.

Open arthrotomies are likewise performed on joints for impending or early joint infection and for the removal of foreign bodies and damaged tissue. Only the capsule of the joint is sutured. Severed peripheral nerves are exposed and sutured about three weeks after secondary closure if wound healing has been by primium. Experience in the North African Theater shows that about 95 per cent of these wounds so heal.



The closed plaster (Trueta and Orr) management of fractures and extensive extremity wounds that was recommended at the beginning of the war to lessen infection and save life has been found to exact a high price in skeletal and soft tissue deformity. Plaster casts are now being used ordinarily for transportation only and are removed on the admission of the patient to the general hospital at the base. Fractures of long bones are treated by skeletal traction, using the Balkan frame and Keller hinged half-ring splint with Pierson attachment, so that length and alignment may be obtained and maintained.

These are some of the advances I saw in our general hospitals in Naples and Rome that have been made under the able direction of Colonel Churchill of Boston, who is Chief Consultant in Surgery in that Theater. The same method is being used in the European Theater.

Better than 97 per cent of our wounded survive. These patients do not look toxic, undernourished, anemic or ill as they did in World War I. Most of them are afebrile on their arrival at the general hospital. The mortality from abdominal wounds has been reduced 100 per cent; in chest wounds from 50 to 15 per cent; in head wounds from 14 to 4 per cent. You will agree with me, I am sure, that the American soldier's doctor *has not* and *will not* let him down and that he has fully justified the confidence placed in him by his patient. No soldier in any army, at any time, in any war has received better medical care than is now being given our American wounded.

The Medical Department of the Army is most grateful to the skillfully trained specialists, both men and women, who have volunteered their services to make this great achievement possible, and it is not unmindful of the fact that great credit is due to the consistently high standards in medical and surgical education in this as well as the other medical schools of our country for the past twenty-five years.

I have told you something about the surgery in this war. The record of preventive medicine and medical care is no less epic-making. Due to immunization there have been no deaths from yellow fever, typhus, tetanus or plague, and the incidence of typhoid, paratyphoid, smallpox, and cholera has been minimal. The new insecticide, DDT, prevented an epidemic of typhus in Naples and is lethal to such insect vectors as the fly, the mosquito, the louse, and the flea. Clothing properly impregnated with this chemical is protective as long as three weeks, even if it be washed many times during this period.

The mortality rate from diseases in our entire Army, which is stationed throughout the world, was .6 per thousand per annum in 1943. The pneumonia mortality rate has been reduced from 25 to .6 per cent, meningitis from 34 to 4 per cent. The admission rate per thousand per annum for tuberculosis has been reduced from 12.5 to 1.2 as the result of the chest roentgen ray examination of each inductee. The incidence of malaria

infection which was so high in the tropics early in the war has been markedly reduced by proper malaria control measures and is definitely on the decline in overseas theaters. Atabrine has been found to be more useful than quinine as a suppressive as well as a curative agent. The death rate for malaria is at a new low level.

The reconditioning program in operation in all Army hospitals is achieving remarkable results with both the physically and mentally disabled. It makes use of physical therapy, occupational therapy, recreation, and education, beginning as soon as the patient reaches the convalescent stage in order to restore his physical strength and to encourage a healthy mental attitude. Reconditioning is reducing the length of hospitalization, lowering readmission rates, and returning men to duty or to civilian life in the best possible physical and mental condition. Statistics recently compiled show that during the first six months of this year 60 per cent of battle casualties who participated in the reconditioning program in this country were returned to duty.

We welcome you graduates in medicine and in nursing into a new era of preventive medicine, curative medicine, and surgery, knowing that you will take full advantage of the opportunities offered you to bring the healing art to an even higher standard in the years to come and carry on the fine traditions of our Alma Mater.

**PROCEEDINGS**  
of the  
**University of Maryland Biological Society**

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**ONE HUNDRED AND THIRTY-SIXTH PROGRAM MEETING**

The One Hundred and Thirty-Sixth Program Meeting was held on Wednesday, June 21, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

Dr. J. Howard Brown of the Department of Bacteriology, Johns Hopkins University, was the guest speaker and read a paper on "Speculation as to the Biological Significance of the Survival of Bacteria in High Vacuum."

**ONE HUNDRED AND THIRTY-SEVENTH PROGRAM MEETING**

The One Hundred and Thirty-Seventh Program Meeting was held on Wednesday, October 25, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

The following program was presented:

"Synthesis of Atropine-like Compounds under Biological Conditions," by L. C. Kagle, Ph.D., School of Pharmacy, University of Maryland.

"Synthesis of the Methyl Ester of the Amino Acid Serine," by A. M. Mattocks, B.S., School of Pharmacy, University of Maryland.

"The Insecticide, DDT," by Rev. C. P. Dillon, A.B., School of Pharmacy, University of Maryland.

**ONE HUNDRED AND THIRTY-EIGHTH PROGRAM MEETING**

The One Hundred and Thirty-Eighth Program Meeting was held on Wednesday, November 29, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

The program consisted of the following papers:

"The Torsion of the Humerus: A Phylogenetic Survey," by Dr. F. Gaynor

Evans and Mr. Vernon E. Krah1, Department of Gross Anatomy, School of Medicine, University of Maryland.

"Phosphatase in the Guinea Pig Placenta," by Dr. Walter L. Hard, Department of Histology, School of Medicine, University of Maryland.

Abstracts follow.

#### THE TORSION OF THE HUMERUS: A PHYLOGENETIC SURVEY

F. GAYNOR EVANS, PH.D. AND VERNON E. KRAHL, M.S.\*

In spite of an extensive literature on humeral torsion, the theories offered to account for it have been varied and contradictory. Modern anatomy textbooks inadequately describe torsion, confuse it with rotation of the limb, or neglect it entirely.

The study made here of thirty-two species, living and fossil, of mammals, reptiles, and amphibians shows that humeral torsion is a tetrapod character.

The values for the measurements on 236 human humeri agree closely with those of Broca and of Gegenbaur. The reports by previous workers that there is a gradual increase in the torsion angle as one ascends the vertebrate scale are confirmed. In homo, with few exceptions, torsion is found to be greater in the female; however, the authors do not agree that it is consistently greater on the left than on the right.

All humeri, including those of fossil reptiles and amphibians, show a torsion. Gegenbaur has reported that fetal humeri are twisted less than in the adult. Thus there appear to be two types of torsion: a primary one which is inherited and a secondary one which develops during ontogeny.

Since torsion is present in the earliest tetrapods, it is felt that one must look to the transition of the crossopterygian fin into a primitive tetrapod limb for the cause of the primary humeral torsion.

There is reason to believe with LeDamany and others that unequal muscular forces acting upon different portions of the humerus are responsible for the production of secondary torsion.

The values obtained here represent the sum of these two torsions.

A new instrument, the torsiometer, was used in this investigation. Several instruments have been devised by previous workers for measuring the torsion in long bones. These, however, involve cumbersome procedures and do not permit direct measurements. The torsiometer and its recent modification for use with small bones made it possible to make measurements of humeral torsion rapidly, directly, and with great accuracy.

#### PHOSPHATASE IN THE GUINEA PIG PLACENTA†

WALTER L. HARD, PH.D.‡

Phosphatase has been implicated as one of the agents involved in the conversion of glycogen to sugar, in the absorption of sugars, and possible roles in the metabolism of other substances. Since the placenta represents a regulator of fetal metabolism in its selective permeability and storage of foodstuffs, the possible activity of phosphatase was indicated.

The histologic distribution of phosphatase (Gomori's method) has been analyzed in the

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\*From the Department of Gross Anatomy, School of Medicine, University of Maryland.

†The expense of this investigation has been defrayed in part by a grant from the Bressler Alumni Research Fund of the School of Medicine, University of Maryland.

‡From the Department of Histology, School of Medicine, University of Maryland.



placenta and associated membranes of gestation ages from eleven days to birth. Within the recently implanted blastocyst phosphatase occurs solely in the endodermal cells surrounding the embryonic disk and those destined to form the yolk sac. The superficial zone of decidual cells surrounding the blastocyst is negative in reaction but a deeper, more prominent zone is decidedly positive.

Throughout the gestation period the labyrinth zone has a heavy concentration of phosphatase in contrast to the spongy zone which is consistently negative. The subplacenta, allantoic vessels, mesenchyma, and giant cells are negative. In the *junctional* zone an occasional multinucleated cell mass shows a slight positive reaction. The decidual layer as a whole is at first negative but later the cells show a prominent positive reaction.

Those cells of the endodermal yolk sac which surround the uterus are strongly positive up to the forty-five to fifty day period, after which time cells in localized areas become negative and by fifty to sixty days the entire epithelium is negative. The endodermal yolk sac cells from the region of the sinus terminalis and extending over the surface of the placenta are always negative. The amnion is negative.

Concentrations of alkaline phosphatase vary from 5 to 25 units throughout the gestational period. The higher levels are attained between fifty to fifty-five days' gestation.

The relationship of the distribution and concentration of phosphatase has been interpreted in the light of its possible role in sugar and fat metabolism.

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The names listed above are officers for the term beginning July 1, 1943 and ending June 30, 1945

## COMMENCEMENT EXERCISES

SEPTEMBER 29, 1944

*The Lyric—Baltimore*

## ORDER OF EXERCISES

- I. THE PROCESSION: *The Coronation March*, Myerbeer; *Pomp and Circumstance*, Elgar.
- II. INVOCATION: RT. REV. NOBLE C. POWELL, D.D., *Bishop of Maryland*.
- III. GREETINGS: ROBERT U. PATTERSON, M.D., C.M., LL.D., *Dean, School of Medicine*; H. C. BYRD, B.S., LL.D., D.Sc., *President, University of Maryland*; HON. HERBERT R. O'CONOR, A.B., LL.B., LL.D., *Governor of Maryland*.
- IV. THE ADDRESS: NORMAN THOMAS KIRK, M.D., Major General, U.S.A., *The Surgeon General*.
- V. CONFERRING OF DEGREES: PRESIDENT H. C. BYRD.  
*Honorary Degree*: Norman Thomas Kirk, Doctor of Science, School of Medicine. Presentation by Dean Robert U. Patterson.  
 President Byrd:

I have the honor to present to you Major General Norman Thomas Kirk of the United States Army, a graduate of the School of Medicine, University of Maryland, Class of 1910, to receive the honorary degree of Doctor of Science awarded to him by the Board of Regents of the University.

Distinguished in the field of general surgery, orthopedic surgery, and in the

administration of the Medical Department of the Army, General Kirk is responsible for the preservation of the health, and the complete medical and surgical care of every member of the United States Army and of the Army of the United States. General Kirk has one of the largest medical tasks in our country. During a state of war, as at the present time, he has unquestionably the greatest individual medical responsibility in the world.

A courageous soldier, an able physician, an outstanding administrator, his Alma Mater is pleased to confer upon him this honorary degree as a mark of its esteem and affection for him as a man, and in appreciation of the great contribution he is making in the service of his country.

*Presentation of Commissions in the Medical Corps, A.U.S.: LIEUT.*

COL. JOHN C. PETH, Commandant, 3316th Service Unit, U.S.A.

*Presentation of Commissions in the Medical Corps, U.S.N.R.:*

LIEUT. R. D. MATTHEWS, Commanding Officer, U.S.N.R.

*Presentation of Graduates:* DR. WALTER L. HARD, Assistant Professor of Histology.

### *Class Roll*

Jose Alberto Alvarez  
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 Mary Stuart Wilson  
 Allen Curtis Wooden  
 Olin Cain Woodrum  
 Isaac Clark Wright  
 Stanley Norman Yaffe

# VI. AWARDING OF HONORS: DR. ROBERT U. PATTERSON, *Dean*.

## UNIVERSITY PRIZE GOLD MEDAL

William Carl Ebeling, III

## CERTIFICATES OF HONOR

Miles E. Drake  
 Maurice Feldman, Jr.  
 Marvin Goldstein  
 Herman James Lambert, Jr.  
 Lewis Bradford Thompson

# VII. ADMINISTERING OF OATH: ARTHUR M. SHIPLEY, M.D., D.Sc., *Professor of Surgery*.

## SPONSIO ACADEMICA

I, ....., having received the required instruction in medical science and now qualified to receive a degree, do promise in the presence of a Holy God, Searcher of Hearts, that I will to the last breath of life continue in the duties of one grateful to the University and that furthermore I will employ my skill in medicine cautiously, conscientiously and honorably and, that so far as in me lies, I will faithfully look after all those things that are helpful in bringing about the health of bodies that are sick, and finally that I will not without urgent reason divulge those things either seen or heard during medical practice which should be kept secret. So may the Divine Being be present to witness my oath.

# VIII. BENEDICTION: RT. REV. NOBLE C. POWELL, D.D., *Bishop of Maryland*.

## IX. THE RECESSION: *March of the Priests*, Mendelssohn.

Herewith reproduced is a letter sent out on November 1, 1944 to all contributors to the Bressler Alumni Research Fund:

The Bressler\* Alumni Research Fund was originally created to meet a definite need. This was to provide funds to finance an expanded program of research in the newly constructed Bressler Research Laboratory, provided adequate financial assistance could be found to support such a program. Dr. Bressler's will deferred the use of his bequest to the School for fifteen years following his death and it was to span a part of this gap that



the Bressler Alumni Research Fund was created. It has adequately served this purpose and each contributor to the Fund deserves credit for his share in accomplishing this result.

The five years pledge to the support of the Fund expires with the current payment to the Fund. It therefore seems appropriate that some accounting be rendered to those whose money has kept the Fund in existence. A condensed financial statement is therefore appended to this letter, together with a list of publications and projects in progress which have been aided by the Fund.

A large proportion of the grants in aid has been expended on apparatus which was needed to pursue a given line of research. Such apparatus represents permanent investment and will serve as a Bressler Alumni Research Fund aid to research for many years to come. It is a satisfaction, I think, to know that the Fund is thus extending its usefulness far beyond the immediate research problems for which grants have been made.

Should so useful an activity of our Alumni as that represented by the maintenance of the Bressler Alumni Research Fund be permitted to lapse before the income from the Bressler endowment becomes available to take its place? Your Bressler Alumni Research Fund Committee which disburses these funds feels that this would be a pity. It furthermore feels that many Alumni would welcome the opportunity of continuing their participation in the research activities of the School by annual contributions to the upkeep of this Fund pending the acquisition of the Bressler bequest. This will be a matter of about five years. Will you not write and let me know if you favor such a move and, if so, whether you would contribute to the upkeep of the Fund?

If such a plan is adopted, it has been suggested that future contributors to the Bressler Alumni Research Fund, as above outlined, should be regarded as sustaining members of the Fund and that certificates appropriate for framing be issued by the School to such sustaining Alumni. It is also suggested that reprints of papers published through the aid of the Fund be sent to any sustaining Alumnus who desires to have them. You might suggest other appropriate benefits which might be granted such sustaining members. Of course, the greatest reward to any contributor is his own satisfaction in helping a cause which he believes is worthy and should be aided.

Hoping that you will approve the extension of this, your own Alumni Research Fund, and thanking you most cordially for your part in creating and supporting the Fund, I remain

Very sincerely yours,

CARL L. DAVIS, M.D.

*Treasurer*

## FINANCIAL STATEMENT OF THE BRESSLER ALUMNI RESEARCH FUND

To August 31, 1944

Amount collected.....		\$23,041.50
Amount appropriated for grants.....	\$11,665.90	
Other disbursements.....	1,655.67	
		<hr/>
Total disbursements.....	13,321.57	13,321.57
		<hr/>
Balance.....		\$9,719.93
Grants unexpended.....	571.98	571.98
Interest.....	118.00	118.00
Refund from sale of animals.....	7.00	7.00
		<hr/>
Total cash balance.....		\$10,416.91

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RESEARCH FUND

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*Ready for Publication*

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NEWS FROM THOSE IN THE ARMED FORCES

CITATION

Lieut. (j.g.) G. H. Richards, Jr., M.C., U.S.N.R., Class of March, 1943, has been cited for his services during the recent invasion of France. The commendation read as follows:

In the recent invasion of France the performance of your duties aided materially in making the beachhead and carrying out the assigned duties of your command.

Therefore, for outstanding service showing great ability, resourcefulness, untiring energy and devotion to duty while serving under trying and adverse conditions, and for performance of duty in the finest traditions of the Naval Service, you are commended.

At present Lieutenant Richards is stationed at the U. S. Naval Hospital, Bainbridge, Md.

Capt. M. Paul Byerly, Class of 1925, is serving in the Pacific Area as flight surgeon with the 3rd Emergency Rescue Squadron.

Capt. Julius C. Brooks, Class of 1941, recently was promoted to his present rank.

Major George H. Crofton, P. & S., 1914, is on active duty and stationed in Washington, D. C.

Major David Sashin, Class of 1926, is on duty at the Oliver General Hospital in Augusta, Ga. He is assistant chief of the orthopedic section and chief of the officers' section of the hospital.

Major Fred E. Murphy, Jr., Class of 1940, recently was promoted to his present rank at an advance base of the 7th AAF Fighter Command.

Major Murphy, currently serving as flight surgeon for a night fighter command in the Marianas and as assistant flight surgeon for the 7th AAF Fighter Command, has been in the Central Pacific Area since July, 1943. One of the first dozen flight surgeons to report for duty with the 7th Air Force, which now has more than a hundred flight surgeons, he served in the Hawaiian Islands, Canton, Tarawa, and Eniwetok before assignment to his present duties in the Mariana Islands.

Major Daniel R. Robinson, Class of 1933, recently was promoted to his present rank. He is serving with the 59th Air Depot Group stationed at San Antonio, Texas.

Major Ernest Michaelson, Class of 1938, has returned from active service in the European Theater of Operations. While overseas Major Michaelson served as regimental surgeon with an infantry unit which took part in a number of important engagements. He is now a patient in McGuire General Hospital, Richmond, Va. and expects to be discharged in the near future.

Major Michaelson has been awarded a Bronze Star in recognition of his services.



Capt. John J. Bunting, Class of 1938, has been made chief of the laboratory service at the Army Air Forces Redistribution Station #1, Atlantic City, N. J.

Captain Bunting was called to active duty as first lieutenant in June, 1941, graduated from the School of Aviation Medicine, Randolph Field, Texas in December of the same year, and went overseas in January, 1942 to serve as flight surgeon of a fighter squadron in the Pacific area for two years. He was promoted to captaincy in September, 1942 and was awarded a letter of commendation from the commanding general of the 7th Fighter Command for outstanding achievements in field sanitation under difficult conditions, and maintenance of high combat efficiency and morale among flying personnel.

Upon completion of two years' service in the Pacific in the Gilbert and Marshall Islands he returned in February, 1944 and graduated from the School of Tropical Medicine, Army Medical Center, Washington, D. C.

The AAFRS #1 in Atlantic City is one of the three redistribution stations in this country through which all Army Air Force personnel returning from combat is directed, classified, and examined.

Major Frederick L. Graff, Class of 1938, has been stationed in Guadalcanal with the 7th Evacuation Hospital. He is in charge of the eye, ear, nose, and throat section and recently was moved with this hospital to a new location.

14 November, 1944

When the mail clerk returned to the ship this afternoon he brought with him a battered copy of the Bulletin which had been kicking around the world since August. It is the July issue and brought with it more than a little nostalgia for Baltimore and home, as well as news of friends and classmates.

I am still aboard the USS Howard—DMS-7 (destroyer type minesweeper) and a recent relaxation of the censorship regulations permits telling a little of our travels and activities. We were scheduled for the Marshalls operation but did not quite make it. However, we did sweep before Saipan and Tinian in the Marianas invasion. It won't be easy to forget names like Marpi Point and Garapan, Tinian Town and Aginapan.

Thoughtfully, the enemy held his fire or did not consider us important enough to expend his ammunition on us when we closed to within 500 yards of the reef to clear the way for the landing craft. We did not know at the time, but we were just about asking to be blown out of the water by the cleverly emplaced artillery which later gave successive waves of marines more than a little trouble. Those days and nights seem too far in the past now to have been real; besides, we've had other work to do.

The first American ship to return to the Philippines in the recent invasion of Leyte was the Howard. Again we were lucky. In the first place, the enemy could not find us if he wanted to. Our job was to help clear the channel for the invasion fleet. This chore had to be done in rather rugged weather or the carefully coordinated plans for the operation would have to be altered. Well, a typhoon on a four stack destroyer is an experience most of us would cheerfully forego.

The next day, when the storm had abated and we were able to dry ourselves and look to the bruises we had collected, we sighted and closed in on several small sailboats and outrigger canoes. Each of them contained three or four Filipinos. I must admit that there was a sizeable lump in my throat and a momentary blurring of vision when I watched these men repeatedly salute our ensign which the storm had ripped to shreds the night before. They were bursting with happiness and full of information concerning the enemy. One of the men was a former professor of chemistry at the University of Manila. His story was incredible. Since the Japanese had invaded the Islands he had been living in the hills and jungles, organizing resistance, accumulating information against the day when it would be possible for him to live and breathe a free man.

These Filipinos made a deep impression on us, for our contact with the enemy and his works heretofore had been remote and indirect. These men personalized the war for us in a way that we had not experienced before. It was different from the flash of a plane attacking or the sound and sight of gunfire, and I have reason to believe that the significance of it was not lost on most of the crew of the Howard.

It was a particularly well chosen time when we left Leyte.

Aside from a decidedly increasing baldness radically accentuated by the *royal barber* in recent *shellback* ceremonies on crossing the equator, the past two and a half years have left me none the worse for wear.

May I extend my best wishes for a Merry Christmas and a Happy New Year that will bring peace and a richly deserved lightening of all our heavy burdens.

Sincerely,

NOCKY DAVIDSON

(*Lieut. Nachman Davidson, M.C., U.S.N.R.*)

Somewhere in New Guinea

You will probably be quite surprised to hear from me. Although I have often thought of my medical school days at the University of Maryland, I decided I wouldn't write anyone until I had seen combat.

I was a battalion surgeon in an infantry division in the South Pacific. Our outfit made the initial landings on one of the islands in the Palau group.

I came ashore about thirty minutes after H hour and before I could reach land I was hit three times. It really is quite discouraging to train for two years and then not be able to do any good when the time comes. I was thoroughly disgusted with myself. We landed about seventy-five feet from a pillbox and it was a machine gun that got me. How they ever missed killing a big target like me I'll never know. About two hours later I was evacuated back to the ship. When I was hit in landing I fell in the water, losing my helmet, and I spent a mighty uncomfortable fifteen minutes after being dragged onto the beach with no protection. Landing on a hostile beach is indescribable.

I have a compound comminuted fracture of the left radius, with some nerve involvement. The wounds in my thigh and across my chest have practically all healed. I am now in a station hospital in New Guinea and awaiting transfer to a general hospital. Just what they are going to do with me I don't know.

This hospital is staffed mostly with doctors from Jefferson and Penn. Tom Percy, a classmate of mine, is assigned to one of the general hospitals here and we have had a lot of fun going over old times. From what he tells me he is getting to do a lot of work. He is really quite fortunate since I have done nothing for over two years except train men, patch up feet, and live in the mud. Frankly, I have forgotten so much medicine that I am worried. However, everyone to whom I have talked is in the same boat. What do you think the chances are of getting internships and residencies after the war?

Some of the nurses here and also a few of the doctors have worked in the 42nd General in Australia. All thought our Maryland doctors and nurses were fine. Made me feel kinda proud. Colonel Pincoffs is well thought of down here, and rightly so. Besides Percy I have only met one other doctor from Maryland. His name was Vance, I believe, who graduated around 1935. He was attached to a cavalry division.

We spent about three months in Hawaii training for our operation. It is a very pretty place but Waikiki Beach is overrated. Before we made our real landing we had two "dry" runs on Guadalcanal. It is a rough spot and you can see why it took so long to take the place. The jungle is quite thick and the heat oppressive. Everyone was mighty happy that we didn't have to make the initial assault there.

Since I have been in the Army I have naturally met doctors from all over the country. I'm very happy to tell you that the principles of medicine that I learned at Maryland have stood me in good stead. I feel that I have a good foundation in medicine, so that my treatment corresponds closely with that of other doctors from other parts of the country. Saves a lot of conflict when different doctors treat the same case. I am planning to go

back to a hospital and take some work in pediatrics. I expect to practice in Catonsville but there is a lot of water to cross before I start worrying about that.

How are things back at the school? I don't suppose I would recognize the place. Here's hoping that all of us will be back in the near future.

Sincerely,

CAPT. EDWARD L. FREY, JR. (Class of 1941)

### ITEMS

Dr. Thomas S. Saunders, Class of 1932, recently was elected secretary of the Oregon State Medical Society.

Dr. E. H. Hedrick, Class of 1917, has been elected to serve as Congressman for the sixth congressional district of West Virginia. Dr. Hedrick is a resident of Beckley, where he has been engaged in the general practice of medicine for many years. In 1943 he was appointed superintendent of Pinecrest Sanitarium of Beckley.

Dean Robert U. Patterson participated in memorial services for the late Dr. Frederick A. Besley on November 19, 1944. The program was arranged under the auspices of the American College of Surgeons and was held in Memorial Hall, Chicago.

The Ohio Chemical and Manufacturing Company of Cleveland, Ohio has awarded a fellowship of \$4,000 to the Department of Pharmacology of the School of Medicine, University of Maryland for the study of volatile anesthetics, especially "Propethylene," a new volatile anesthetic developed in this laboratory. The work is under the direction of Dr. John C. Krantz, Jr., Professor of Pharmacology.

A fellowship of \$5,000 has been awarded by the Emerson Drug Company of Baltimore to the same department. The purpose of this grant is to study analgesics and the mechanism of the relief of pain. This work also is under the direction of Dr. John C. Krantz, Jr.

Robert Garey Winslow, the son of Caleb Winslow, at one time registrar of the University of Maryland, and a grandson of the late Dr. Randolph Winslow, died on July 11, 1944 at the age of twenty-four. His untimely death at this early age ended a most promising career and his loss is deeply regretted by the numerous friends of the Winslow family.



## OBITUARIES

### SIMEON V. T. MARKLINE, M.D.

Dr. Simeon V. T. Markline, one of the city's younger general practitioners, died on November 21, 1944 after an illness of about one month.

A native of White Hall, Dr. Markline was graduated from Western Maryland College in 1936. He received his degree in medicine from the School of Medicine, University of Maryland in 1940. Immediately after his internship he began to practice in Hampden. He was an associate physician of the West Baltimore General Hospital.

**Abercrombie, John Robert**, Baltimore, Md.; class of 1895; aged 75; died, August 3, 1944.

**Arble, Ellsworth Frederick**, Carrolltown, Pa.; B.M.C., class of 1898; served during World War I; aged 71; died, July 5, 1944, of hypertensive heart disease.

**Austin, James Cornelius**, Spencer, Mass.; P. & S., class of 1896; aged 69; died, July 10, 1944, of cerebral hemorrhage.

**Bierer, John A.**, Mount Joy, Pa.; P. & S., class of 1885; aged 86; died, August 27, 1944, of carcinoma of the liver.

**Blair, Edward H.**, Hartford, Conn.; P. & S., class of 1906; aged 65; died, August 14, 1944, of coronary thrombosis.

**Blanchette, William Henry**, Fall River, Mass.; B.M.C., class of 1896; served during World War I; aged 71; died, August 1, 1944.

**Brinham, Alfred William**, Windber, Pa.; P. & S., class of 1905; aged 63; died, June 22, 1944, of acute nephritis.

**Friedman, Morris**, Brooklyn, N. Y.; B.M.C., class of 1896; aged 87; died, October 31, 1944, of bronchopneumonia and cerebral thrombosis.

**George, Archibald Whittington**, Detroit, Mich.; B.M.C., class of 1911; aged 60; died, July 21, 1944, of sarcoma of the left ureter.

**Igartua, Jose E.**, Aguadilla, P. R.; class of 1911; aged 54; died, May 15, 1944, of cardiovascular renal disease.

**Jones, William Merritt**, Greensboro, N. C.; class of 1903; aged 63; died, July 29, 1944, of carcinoma of the lung.

**Lewis, William Figures**, Col. U.S.A. (retired), Pasadena, Calif.; class of 1893; served during World War I; aged 78; died, September, 10, 1944, of arteriosclerotic heart disease.

**Love, Bedford E.**, Roxboro, N. C.; class of 1904; aged 71; died, June 15, 1944, of cerebral hemorrhage.

- MacMillan, George W.**, Lakewood, N. J.; P. & S., class of 1890; aged 81; died, June 1, 1944, of acute myocarditis and carcinoma of the lower lip.
- Reeves, Benjamin Everett**, West Jefferson, N. C.; P. & S., class of 1891; aged 77; died, August 30, 1944, of heart disease.
- Schaffner, Daniel Webster**, Enhaut, Pa.; class of 1887; aged 87; died, July 5, 1944.
- Street, M. Eugene**, Glendon, N. C.; P. & S., class of 1893; died, July 14, 1944, of coronary occlusion.
- Walker, Herbert Dillon**, Elizabeth City, N. C.; class of 1902; aged 67; died, July 7, 1944, of cerebral hemorrhage.
- Weston, Herbert Tiffany**, West Hartford, Conn.; B.M.C., class of 1890; aged 75; died, July 28, 1944, of heart disease.
- White, James Alexander**, Alexandria, La.; P. & S., class of 1892; aged 76; died, May 23, 1944, of coronary thrombosis.
- Whitney, Edward Luther**, Walla Walla, Wash.; B.M.C., class of 1895; aged 73; died, September 13, 1944, of bilateral hemiplagia.
- Wilson, Harry M.**, Evans City, Pa.; class of 1889; aged 78; died, July 25, 1944.

# BULLETIN

OF THE

## SCHOOL OF MEDICINE

UNIVERSITY OF MARYLAND

Vol. 29

APRIL, 1945

No. 5

### LIGATION OF THE PATENT DUCTUS ARTERIOSUS\*

WITH A REPORT OF A SUCCESSFUL CASE

ALVIN H. HONIGMAN, B.S., M.D.† AND OTTO C. BRANTIGAN, B.S., M.D.‡

BALTIMORE, MD.

The recent successes in the operative treatment of patent ductus arteriosus have brought this lesion into clinical prominence. The ductus arteriosus is present during fetal life as a compensatory mechanism whereby blood can be short-circuited around the lungs (17). Blood is diverted from the pulmonary artery directly into the aorta, thus avoiding the resistance to the circulation offered by the incomplete expansion of the fetal lungs. After birth, the lungs expand and the ductus arteriosus closes, allowing the blood to be passed through the lungs and aerated. The time at which the ductus arteriosus ceases to function is varied. Patton (36) reported degenerative changes in the latter part of fetal life. Scammon and Norris (37) have found that the diminution in size of the ductus is a gradual process requiring weeks before occlusion is complete. Schaeffer (38) has concluded that the process of occlusion is of the histologic pattern of endarteritis obliterans. It is believed by Christie (8) that about 12 per cent of the ducti are closed by the third week of postnatal life, 37 per cent at the end of the first month, 76 per cent after the third month, and 95 per cent by the end of nine months. It can be assumed on this basis that the presence of an open ductus arteriosus after the end of the first year of life should be regarded as abnormal.

The theories of the mechanism by which the ductus arteriosus closes have been summarized by Wells (47) as follows: The first expansion of the large bronchi by air compresses the ductus; thrombosis in its lumen and subse-

\* Received for publication September 27, 1944.

† From the Department of Medicine, School of Medicine, University of Maryland.

‡ From the Department of Surgery, School of Medicine, University of Maryland.

quent adhesion of the walls closes the ductus; bending of the arch of the aorta by increased pressure after birth causes closure; the beginning of respiration produces changes in the position of the thoracic viscera and this causes tension and collapse of the ductus; failure of growth in the intima leads to occlusion of the ductus; active constriction of the layers of the wall of the ductus closes it; fibrous bands passing over the ductus are connected with the diaphragm and, on descent of the diaphragm with respiration, the



FIG. 1. Schema of normal circulation. Unoxxygenated blood is dark, arterial blood is white.

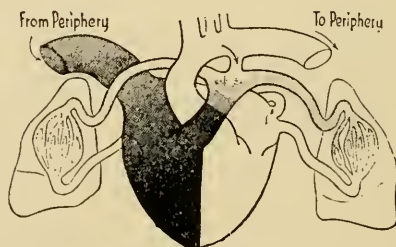


FIG. 2. Schema of abnormal circulation with patent ductus arteriosus. Note mixture of arterial (oxy-genated) blood with venous (unoxxygenated) blood in pulmonary artery, and recirculation of blood through left side of heart.

bands are pulled down and occlude the ductus; a thin crescentic fold of tissue present at the end of the ductus acts like a valve in preventing the flow of blood from the aorta into the ductus. Kennedy and Clark (29, 30, 31) believed the closure of the ductus to be a process having two phases. The first is an immediate reaction taking place a few minutes after birth and is essentially a constriction of the muscular wall of the ductus. The second phase involves histologic closure of the lumen and replacement of the muscular element in the wall by fibrous connective tissue, and results



in conversion of the ductus into the ligamentum arteriosum. In their experiments with guinea pigs, Kennedy and Clark have found the ductus to have the capacity to close in response to a variety of stimuli, the most important of which is breathing. In guinea pigs, oxygen by vein would cause closure of the ducti and it is possible that in humans this closure could be the result of an increased oxygenation of the fetal blood following birth.

The persistence of the ductus arteriosus after birth causes the formation of what is essentially an arteriovenous aneurysm. There is a reversal of flow within the ductus because the expansion of the lungs has lessened pulmonary pressure, whereas there is an increase in aortic pressure. Subsequently, the blood passes from the aorta back through the ductus. This arteriovenous shunt may persist as a compensatory mechanism if associated with other congenital lesions of the heart. Coarctation of the aorta or stenosis of the aortic valves will cause obstruction at the aortic valve, and the ductus may remain open and permit blood to escape to the aorta from the pulmonary artery. The ductus may also act as a compensatory mechanism if associated with atresia or stenosis of the pulmonary valve. In Abbott's (2) series of 1000 cases of congenital heart disease, there were ninety-two cases in which patent ductus arteriosus was the sole lesion, and 150 cases in which the patent ductus was associated with other abnormalities. Gross (17) has endeavored to explain the continued patency of the ductus in cases in which there is no other lesion by considering three possible etiologic factors. The first of these concerns the anatomic direction and position of the vessel. He has found that in the cases on which he has operated, the ductus joins the aortic arch at an obtuse or at a right angle; however, postmortem examinations of infants who have died shortly after birth have revealed the ductus to enter the aortic arch at an acute angle. Gross believed that the sharpness of the angle helps to obliterate the ductus in postnatal life. At birth, when the blood flow through the lungs increases, a diminishing amount of blood is forced from the pulmonary artery into the ductus. The arterial blood circulating in the arch thus exerts a sucking action on the ductus and tends to collapse the vessel. If the angle at which the ductus enters the arch is more obtuse, the lumen will be distended because it is subjected directly to the high pressure in the aortic arch.

The second factor possibly concerned with the continued patency of the ductus is some defect in its wall which would allow the vessel to expand under low internal luminal pressure. This etiologic factor is supported by those cases in which the thin walled ductus has actually dilated to aneurysmal proportions. However, thin inelastic walls are not present in all cases of persistent ductus.

The third condition concerned with the patency of the ductus is related to its neuromuscular control. It is thought that perhaps the ductus is closed functionally during life by a neuromuscular mechanism. The smooth muscle fibers in the duct wall of some animals have been shown to be under vagus nerve control. A deficiency in the neuromuscular apparatus would probably render closure of the ductus more difficult.

The pathologic anatomy of the ductus arteriosus is of considerable importance in considering the potentialities of surgical ligation. Sternberg (41) reported that there is always a characteristic shape and form of the patent ductus in that the opening of the ductus arteriosus into the aorta is funnel-shaped, and that at the pulmonary orifice there is some sign of a membrane or ridge. Jones (5) recognized several other types of ductus, such as extreme shortening, aneurysmal ductus, and cylindrical ductus. The diameter of the ductus is variable and may range from 2 mm. to 1 cm. The length of the ductus is extremely important to the surgeon. In some adults the ductus may be so short that the pulmonary artery and the aorta are connected by an almost direct communication. This condition has been found in a number of the patients operated on and makes surgical ligation impossible. The ductus has been found to be usually about 1 cm. in length. The wall thickness also varies and has been seen to be as thick as an arterial wall in most cases, but in several patients it has had the consistency and thinness of a vein.

An approximate calculation has suggested that about 20,000 people in the United States have a patent ductus arteriosus (40). This large number warrants close investigation into the possibilities of surgical ligation as a means of increasing the life expectancy of these individuals. Bullock (5) found 133 instances of congenital heart disease in 21,000 autopsies in the Los Angeles County Hospital. Thirty-six of these were cases of patent ductus, twenty-one were associated with other lesions. Of 152 patients with congenital cardiac malformations on whom autopsies were performed at the New York Nursery and Child's Hospital, 10.5 per cent were cases of patent ductus arteriosus. Burch (6) has reported that in 54,842 autopsies, 0.11 per cent or sixty-three instances of patent ductus arteriosus were found. In Abbott's (1) series of ninety-two cases in which the patent ductus was the sole cardiac lesion, twenty-eight patients died of subacute bacterial endocarditis, forty of cardiac failure, and two of rupture of the ducti. In the remainder death was attributed to unrelated causes. The average age of death was twenty-four years. Keys and Shapiro (32) have analyzed sixty cases in adults seventeen years of age or over. The average reduction in life expectancy in men was twenty-three years and in women twenty-eight years. The causes of death in these sixty adults were as follows:

Subacute bacterial endocarditis . . . . .	41.7%
Congestive heart failure . . . . .	28.3%
Rupture of a pulmonary aneurysm . . . . .	3.3%
Carcinoma of the stomach . . . . .	1.7%
Suicide . . . . .	1.7%
Probable subacute endocarditis . . . . .	3.3%
Tuberculosis . . . . .	5.0%
Rupture of an aortic aneurysm . . . . .	3.3%
Atrophy of the liver . . . . .	1.7%
Questionable . . . . .	5.0%

Cardiologists have concluded that many children and young adults with patent ductus arteriosus will have their lives or health jeopardized by one of several complications. First, the persistent ductus diverts sufficient blood from the aorta so that a deficiency in peripheral blood flow results and the child is deprived of proper nutrition. Secondly, there is great danger of subacute bacterial endocarditis. Thirdly, a thin walled duct may rupture or dilate to aneurysmal size. Furthermore, there is an increased burden on the heart because the shunt from the aorta to the pulmonary artery increases the total amount of blood which the left ventricle must pump out per minute and increases the resistance to the contraction of the right ventricle. This reduces cardiac reserve and leads to eventual failure.

The clinical signs and symptoms are fairly consistent. About two-thirds of the patients are females. In Abbott's series, 67 per cent were women, and in the cases of Keys and Shapiro, 76.7 per cent were women. The clinical course with an uncomplicated patent ductus may show little variation from the normal or there may be findings of a profound cardiovascular abnormality. When there is a relatively small shunt the heart may be well adjusted to the mechanical handicap, so there is no circulatory embarrassment. In such cases no cardiac hypertrophy occurs and circulation is adequate to permit the normal growth and development of the child. These patients may lead long and active lives. There is a case on record of a man seventy-three years old with a patent ductus arteriosus. For those patients who show no indication of an impaired circulation the term compensated patent ductus arteriosus has been employed by Hubbard (23). When, on the other hand, there is evidence of a shunt large enough to throw a heavy burden on the heart, the term uncompensated patent ductus is used. Here there are signs and symptoms by which the size of the ductus and the severity of the circulatory disturbance can be estimated. The most important of these is a lowering of the diastolic blood pressure which results in a collapsing pulse, wide pulse pressure, and capillary pulsations. The level of the diastolic pressure serves as a guide to the magnitude of the



shunt; the lower the diastolic pressure and the wider the pulse pressure, the greater the amount of blood flowing through the ductus. When the systemic circulation is impaired in childhood, retardation of the physical development may result. Most of these children and young adults are underweight and the fact that their failure to gain is the result of an abnormal circulation is substantiated by the rapidity of gain following ligation.

The majority of patients develop only slight cardiac embarrassment in the early years of life. They tend to tire easily and become dyspneic more readily than their normal playmates. Epistaxis may or may not occur. Dyspnea is the most frequent symptom and there may be decreased vital capacity of the lungs. The physical signs of a patent ductus may be absent in infancy but progress with varying rapidity and by the fifth year the complete clinical features of a patent ductus are present. The cardiac action is forceful and the rate is increased. The murmur of a patent ductus arteriosus is its most distinctive feature. With it a reliable diagnosis can be made even in the absence of any other sign or symptom; without it a definite diagnosis cannot be made. Hubbard described the murmur as a loud, coarse, low frequency sound, crescendo during systole, reaching a maximum intensity at the time of the second sound, and decrescendo during diastole. When it extends from the beginning of the systole to the end of the diastole, as it usually does, it may be described as continuous. Frequently, however, it disappears during the late diastole so that there is a quiet period before the first sound. The maximal intensity of the murmur is over the pulmonic area to the left of the sternum in the second interspace. From here it may be transmitted to the apex, axilla, and widely over the chest. It is usually not transmitted with intensity into the great vessels of the neck. The second sound at the pulmonic area is increased considerably and has a snapping quality. A prominent thrill usually is found over the pulmonic area. It indicates that the vibrations are low enough in frequency and great enough in intensity to allow them to be palpable as well as audible. At the time of operation the vessels have been palpated directly and the thrill appears to arise mostly from the ductus and the adjacent portion of the pulmonary artery, thus suggesting that the thrill and murmur result from vibrations caused by the swirling of arterial blood into the pulmonary circuit. Cardiac enlargement may possibly be ascertained by percussion. The systolic blood pressure is within the normal range; the diastolic pressure is usually low, with a resultant wide pulse pressure. This is an expression of the high stroke volume and diminished peripheral resistance. With the wide pulse pressure there may be a collapsing pulse and capillary pulsations.

A roentgenologic examination of the heart offers confirmatory evidence in most cases. Zinn (49) was one of the first to record roentgen ray find-



ings in a patient with patent ductus arteriosus. He described the dilatation of the pulmonary artery. Wessler and Bass (48) in 1913 emphasized the importance of roentgenography as a diagnostic aid. Hubeny (25) in 1920 made a comprehensive review of the literature on the roentgenologic findings in patent ductus arteriosus. In the early years of life there are no typical findings but after the fourth year roentgen ray findings usually are distinct. The signs to be looked for are:

1. Enlargement of the left ventricle.
2. Enlargement of the left auricle.
3. Dilated pulmonary artery.
4. Exaggerated beat of the left ventricle and pulmonary artery.
5. Engorgement of the pulmonary vessels.
6. Hilar dance, systolic expansion of the vessels in the hilus of the lung.

Donovan, Neuhauser, and Sossman (9) have reported the following roentgenographic findings in fifty cases of patent ductus arteriosus: The left ventricle was found to be enlarged in 76 per cent of the series; the left auricle was enlarged in 71 per cent; dilatation of the pulmonary artery was found in 82 per cent; the exaggerated beat of the left ventricle and pulmonary artery was present in 68 per cent; engorgement of the pulmonary vessels was seen in 70 per cent; and the hilar dance was found in 71 per cent of the cases. Eppinger and Burwell (7, 10, 11, 12) have analyzed samples of blood taken from the aorta and pulmonary artery and have shown that from 45 to 75 per cent of the blood pumped out by the left ventricle passed back into the pulmonary artery by way of the ductus. The left ventricle had to pump from two to four times the amount of blood expelled during the same time by the right ventricle. The effects of these altered mechanics are:

1. Left ventricular enlargement as the result of greatly increased output.
2. With each beat an increased volume of blood passes through the left ventricle and pulmonary artery, thus causing increased pulsations of these vessels.
3. Prominence of the pulmonary artery because it receives blood from both the right ventricle and aorta.
4. The extra volume of blood in the pulmonary circulation leads to vascular congestion.
5. If the mitral valve is not wide enough to transmit this large amount of blood, the left auricle dilates because of elevated left auricular pressure.

Angiography also has been used in the diagnosis of the patent ductus. Sternberg, Grishman, and Sossman (41) have used the intravenous injection of 70 per cent diodrast and studied the cardiac outline in cases of patent ductus arteriosus. Their studies have revealed a distinct localized dilata-

tion of the descending aorta just beyond the isthmus, which varies in size and shape from a localized bulge to a uniformly dilated segment; this dilatation may be caused by the infundibulum of the ductus. They have also found an elevation of the main and left pulmonary arteries, the appearance suggesting that they are drawn toward the isthmus of the aorta. A moderate to a considerable dilatation of the pulmonary artery and varying degrees of left ventricular dilatation have also been found by angiography.

The electrocardiogram usually shows no axis deviation and is of little aid in making the diagnosis. Evidence of cardiac hypertrophy may be the only positive electrocardiogram findings (39).

As a rule, the laboratory findings are normal. Compensatory polycythemia does not occur often. Blood volume studies indicate a moderate increase in the cellular and plasma elements of the blood. The venous pressure is usually not elevated and the circulation time from the arm vein to the tongue may be normal or somewhat prolonged.

The differential diagnosis of uncomplicated patent ductus arteriosus is not too difficult. Clubbing of the digits and cyanosis are absent, thus excluding the cyanotic group of congenital deformities. The absence of typical electrocardiogram findings, the characteristic murmur, the low diastolic pressure, and the roentgenologic findings aid in differentiating the patent ductus arteriosus from other congenital lesions. Hubbard (23) has summarized the differential diagnosis as follows:

	PATENT DUCTUS ARTERIOSUS		INTERVENTRICULAR SEPTAL DEFECT	INTER-AURICULAR SEPTAL DEFECT	PULMONARY STENOSIS
	Compensated	Uncompensated			
Cyanosis.....	0	0	0	0	+
Clubbing.....	0	0	0	0	+
Murmur.....	To and Fro		Systolic	Systolic	Systolic
Location of murmur....	Pulmonic		Third interspace sternal border	Pulmonic	Pulmonic
Diastolic pressure.....	Normal or Low	Low	Normal	Normal	Normal
Pulmonary congestion...	0	+	0	+	0
Electrocardiogram axis deviation.....	0	0	0	Considerable right	Right

Once the diagnosis of patent ductus arteriosus has been established it must be decided whether the patient's condition meets the criteria for surgical intervention. There are definite contraindications to surgical treatment of patent ductus arteriosus. The presence of other associated

conditions, whose abnormalities are compensated for by the patency of the ductus, is a definite contraindication. Such lesions as coarctation of the aorta and stenosis or atresia of the pulmonary and aortic valves must be ruled out before surgery can be attempted. It was once believed that in the presence of subacute bacterial endarteritis operation should be avoided because of the danger of dislodging the friable vegetations around the ductus and causing an embolism. However, the recent successes in surgery, even in the presence of bacterial endarteritis, have removed this as a contraindication. The presence of rheumatic mitral stenosis is not considered a contraindication for operation because in ligating the ductus one of the burdens on the cardiac reserve will be eliminated and the patient's life expectancy increased.

In considering the indications for surgery the question arises whether all ducti should be ligated regardless of the presence or absence of cardiovascular disturbances. It is believed that in the compensated ducti the indications for operation are nil, because these individuals may live active and long lives without danger of any of the complications mentioned earlier. Then, too, there is evidence that in some children the ductus closes spontaneously or becomes smaller in later childhood and has little or no effect on the cardiovascular system. The indications for surgical ligation of the patent ductus arteriosus as determined by Gross (16, 17, 18, 19, 21), Hubbard (23), and others, can be summarized as follows:

1. Evidence of prominence of the pulmonary artery.
2. Indications of pulmonary congestion.
3. Failure of the patient to develop physically.
4. Symptoms of cardiac enlargement.
5. A low diastolic pressure with a resultant high pulse pressure.
6. The presence of repeated upper respiratory infections.

Numerous attempts to ligate large blood vessels in the chest for the purpose of controlling hemorrhage have been made for many years, but these efforts usually met with failure because of infection. This fact discouraged surgeons from trying ligation of the patent ductus arteriosus, even after Munro's (34) work in 1907. In 1937, Graybiel, Strieder, and Boyer (15) recorded their failure to ligate a patent ductus in an adult because of hemorrhage complicated by subacute bacterial endocarditis. Gross (22) performed the first successful ligation in 1938 by using a new transpleural approach. Since then many successful ligations have been completed with excellent results. Shapiro and Keys (40) collected and analysed data on nearly all the patients on whom ligation of the ductus had been done up until August, 1943. Since then there have probably been numerous other ligations. In the records of Shapiro and Keys 145 patients were operated on by a total of twenty-five surgical teams. Of these cases

107 were uncomplicated, although the operation was performed on thirty-three patients in the presence of subacute bacterial endarteritis. In these 107 cases eighty-one operations were completely successful; the murmur and thrill disappeared, and the pulse pressure decreased. In fourteen instances the machinery murmur returned in from a few weeks to several months after operation. It is probable that in these cases recanalization of the duct occurred because of the failure of the ligature material to hold. In six instances death resulted from rupture of the duct at operation. Two patients developed subacute bacterial endarteritis after the operation. There was one case where death resulted from infection of the surgical wound followed by mediastinitis. In one patient a direct communication was found between the pulmonary artery and the aorta and no attempt was made at ligation. A vessel other than the ductus was ligated in three cases; two of these patients died as a result of the operation. There were nine deaths from these 107 operative cases, a mortality rate of 8.5 per cent. Of the thirty-three patients who were operated on in the presence of subacute bacterial endarteritis, twenty apparently had completely successful results, the blood cultures became sterile, and the patients' general condition improved considerably. Five patients died on the operating table as the result of hemorrhage. In eight cases the fever persisted in spite of ligation of the duct.

The effects of ligation of the ductus arteriosus have been studied experimentally in dogs by Eppinger and Burwell (11) and by Leeds (33). The latter author produced a condition similar to patent ductus arteriosus in dogs by a lateral anastomosis of the aorta to the left pulmonary artery and by end to side anastomosis of the left subclavian artery to the left pulmonary artery. Following the establishment of this fistula a loud murmur and thrill were produced by the flow of a turbulent stream of blood from the aorta into the pulmonary artery; the pulse rate increased; the murmur was machinery-like and best heard in the second left intercostal space. The experimental ducti were then occluded and the immediate effects were: an increase in the systemic arterial blood pressure; a slowing of the pulse rate; a decrease in the cardiac output of both ventricles.

The decrease in cardiac output after occlusion of the ductus was accompanied by a definite degree of deoxygenation in a blood sample taken from the pulmonary artery compared to the oxygen content of samples of blood taken from the aorta.

In humans the results from ligation of a patent ductus arteriosus have been remarkable. Those individuals who were physically retarded have had a gain in weight following operation, which is probably attributable to an increased flow of blood through the body. Patients with varying degrees of cardiovascular disability have had a disappearance of their car-



diac symptoms and are able to be more active physically. The roentgenographic findings show a reduction of ventricular pulsation and a decrease in size of the pulmonary artery and left auricle. The murmur and thrill disappear as soon as the vessel is ligated and a rise in diastolic pressure occurs.

One of the outstanding effects of ligation of the ductus has been the apparent cure of patients who have had subacute bacterial endarteritis superimposed on a patent ductus arteriosus. Touroff (44, 45, 46) first successfully treated one of these patients by surgical ligation of the ductus. After occlusion of the ductus, healing of the vegetations presumably occurs as a result either of the alteration of local mechanical factors or of changes in nutrition, or both. Graybiel (14) reported that according to one theory the organisms die because they no longer enjoy the protection of the fibrin which was precipitated continuously by the action of the blood stream. Another theory is that the organisms in the ductus and pulmonary artery are favored by the high oxygen content of the shunted blood and that an adequate supply of oxygen is lacking after the shunt is closed. Whatever the theory, the results have shown that ligation of a patent ductus does cause an apparent cure of superimposed bacterial endarteritis. However, Touroff (42, 43) emphasized the fact that when vegetations remained confined to the pulmonic end of the ductus and pulmonary artery, peripheral embolism probably will not occur, and the operation is likely to be followed by recovery from the infection. On the other hand, when vegetations have spread to the cardiac valves, peripheral embolism occurs and in these cases operation does not aid the patient.

It is beyond the scope of this paper to dwell on the details and technic of ligation of the patent ductus arteriosus. Johnson and his associates (28) and Gross (20) have set forth in detail the operative steps. However, mention may be made of the material used in the actual ligation. In the earlier operations a single ligature made of heavy braided silk or of narrow linen tape was used. Following some of these ligations a reappearance of the murmur and thrill occurred several weeks postoperatively. This was thought to be the result of recanalization of the duct because of failure of the ligature material. Gross used cellophane in his subsequent operations, wrapping this material around the braided silk ligatures in order to stimulate the regional formation of scar tissue which would contract and squeeze off any minute opening that might exist at the end of the operation. In his last nine cases, Gross completely divided the ductus, and the aortic and pulmonary ends were separately sutured. This is a more difficult procedure but insures a prompt, complete, and permanent closure.

The operative complications have been lessened with the development of improved surgical technic. Hemorrhage may follow if the wall of the ductus

is thin and friable, and is particularly certain to occur where there is superimposed bacterial endarteritis. The infection renders the ductus even more friable, and rupture or cutting through of the ligature results. The usual postoperative surgical complications of pneumonia, atelectasis, and wound infection may occur as in any major surgical procedure. Pleural effusion on the left may result postoperatively and may vary from a small amount to a large effusion necessitating a thoracentesis. Postoperative temporary paralysis of the left hemidiaphragm has been found, presumably caused by trauma of the left phrenic nerve at operation. In a few cases false aneurysms have developed at the site of the ductus, possibly resulting from trauma to the wall.

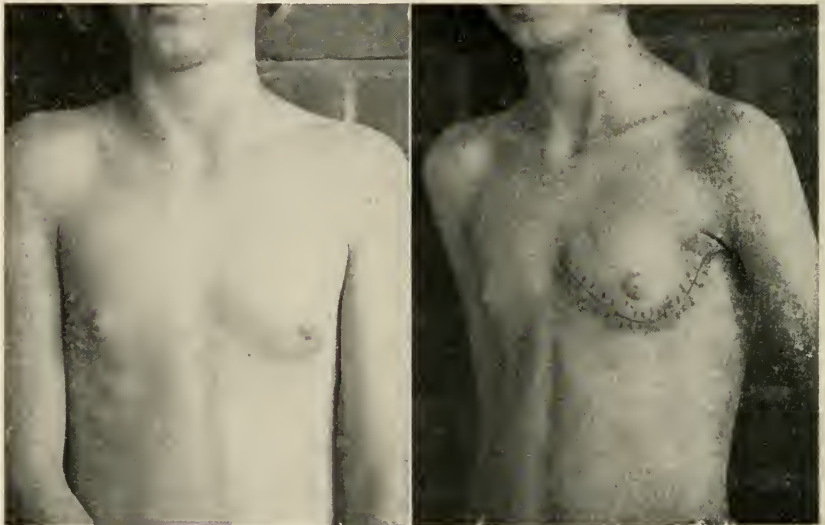


FIG. 3. Photographs taken before and after operation to show operative scar.

#### CASE REPORT

L. H., No. 73,388, a 13 year old white female, was admitted on the medical service on July 2, 1944 with the complaint of shortness of breath on exertion and heart trouble all her life. The patient always had exertional dyspnea and for the past few months frequently experienced a sharp pain around her heart which she claimed "cut off her wind." She had a tremendous appetite but was unable to gain weight and was considered frail as compared with her friends. The patient's mother related that at birth the child had difficulty in breathing and did not take her first breath for five minutes. Since birth she has had numerous infections, those in her early childhood accompanied by convulsions. For the last two years there have been recurrent attacks of upper respiratory infections. The patient has also been aware of palpitations and noticed that she could not keep up with schoolmates of similar age in physical activities. Because of repeated illnesses she did not start school until she was eight years old and when admitted was in the fifth grade.

On admission her temperature was 99.2 F., the pulse rate was 98 per minute, and respirations were 20 per minute. The physical examination revealed a thin, underdeveloped white girl who was in no apparent distress. Her height was 4 feet 11 inches, weight 75 pounds. The head and neck were normal, except for enlarged tonsils and a few palpable cervical lymph glands. There was no cyanosis and no clubbing of the digits. The lungs showed no pathologic change. Examination of the heart recalled a prominent precordial impulse. A presystolic apical thrill and a systolic thrill in the pulmonic area were palpable. The heart measured 7 cm. to the left on percussion. On auscultation, a rough machinery-like murmur was heard throughout systole and diastole in the pulmonic area. This murmur was fairly well localized to this area and the systolic component was much louder than the diastolic one. At the apex a late diastolic rumble was heard, the murmur not being transmitted. The first mitral and the second pulmonic sounds were accentuated. The blood pressure before exercise was 108 mm. of mercury systolic and 50 mm. diastolic in the left arm, 106 and 48 mm. in the right arm, 148 and 62 mm. in the left leg, and 146 and 66 mm. in the right leg. After exercise the blood pressure in the left arm was 132 mm. of mercury systolic and 56 mm. diastolic, 128 and 68 mm. in the right arm, 142 and 82 mm. in the left leg, and 148 and 74 mm. in the right leg. The rest of the physical examination was essentially negative.

*Laboratory findings:* The urinalysis proved negative. Examination of the blood showed red blood cells 4,910,000; white blood cells 7,600; hemoglobin 94% (Sahli); a normal differential. The result of the stool examination was negative. The sedimentation rate was 9 mm. (corrected), with a hematocrit reading of 43%. The serologic test for syphilis was negative, and the blood chemical examinations were within normal range. The carbon dioxide combining power was 47 volumes %. Blood cultures grown under carbon dioxide were negative. A throat culture showed a mixed flora with a predominance of *Streptococcus viridans*. The venous pressure was 7.8 cm. of blood; the vital capacity was 1800 cc.; circulation time from the arm vein to the tongue was 16 seconds, and from the arm vein to the lung, 12 seconds. An intradermal tuberculin test using 1:100,000 dilution was negative. A roentgenogram of the chest showed moderate fullness at the pulmonary conus. Telemo measurements were as follows: Supracardiac 5 cm.; transverse diameter of the chest 22.5 cm.; transverse diameter of the heart 11.2 cm.; right border 3.9 cm.; left border 7.3 cm. An electrocardiogram showed normal rhythm, a PR interval of 0.14 seconds, and QRS complex of 0.08 seconds. The comment was that the electrocardiogram showed changes probably caused by hypertrophy.

On the basis of the physical findings, roentgen ray and electrocardiogram results, the diagnosis of patent ductus arteriosus was made. It was thought that the apical murmur was not indicative of associated congenital defects for which the patent ductus acted as a compensatory mechanism. Because of the cardiac symptoms, physical underdevelopment, history of repeated upper respiratory infections, the low diastolic blood pressure, wide pulse pressure, and evidence of cardiac hypertrophy, it was thought that the patient would be definitely benefited by ligation of the ductus, therefore an operation was advised and accepted.

The operation was performed on July 22, 1944 by O. C. B. Under intratracheal ether anesthesia a curved incision was made below the left breast and extending up laterally around the breast; the skin, subcutaneous tissue, and breast tissue were dissected from the thoracic wall and retracted upward until the third costochondral junction was exposed. The intercostal muscles were divided with the scalpel, and the pleural cavity was opened. The patient experienced no great respiratory difficulty upon collapse of the left lung. The third costochondral junction was divided with a rongeur and a self-retaining retractor put in position, and the third and fourth ribs were separated. The heart was found to be moderately enlarged. A definite forceful thrill with each systole was felt on palpation

over the lower portion of the aorta and pulmonary artery. The vagus and phrenic nerves were located and the pleura split between the nerves. Two Champion silk tension sutures were placed in the anterior folds of this pleura and with some traction of these sutures the anterior pleura was dissected upward. The posterior fold of the pleura was dissected downward until the vagus nerve was exposed and the left recurrent laryngeal nerve was isolated. The patent ductus arteriosus was then located and found to be about 1.5 cm. in length and 1.5 cm. in diameter; it entered the aorta at almost a right angle. Over the surface of the ductus a small pouch of pericardium was seen, and upon dissecting this free, the pericardial sac was opened. A small amount of frothy fluid was obtained. Two Kelly clamps were placed on this opening in the pericardial sac, and using these as retractors the sac was dissected downward. By a combination of blunt and sharp dissection, a right angle clamp was gently placed posteriorly to the patent ductus. The medial

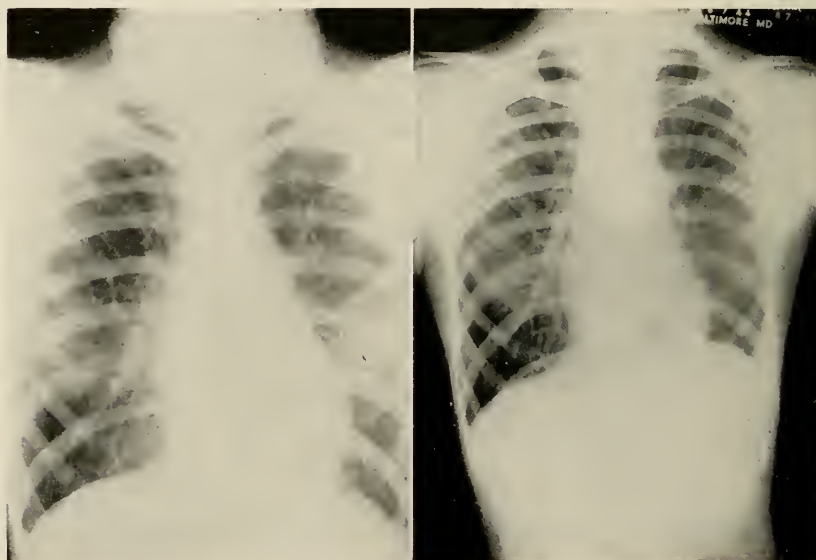
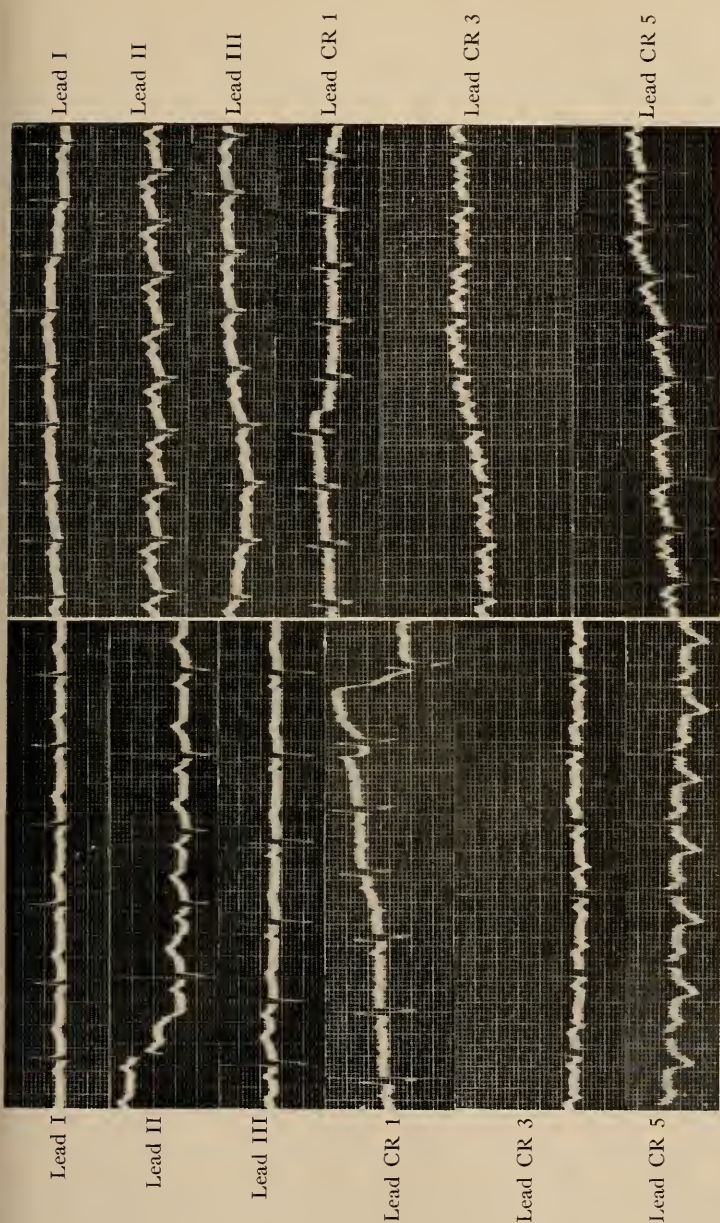


FIG. 4. Roentgenograms made before and after operation.

border of the duct was freed gently and all attachments of the tissue to the recurrent laryngeal nerve were broken. A heavy braided silk tie was placed around the patent ductus and tied toward the pulmonary artery. As soon as the ligature was tied the thrill felt through the chest disappeared, as did the murmur. There was no embarrassment of respiration or circulation. A second braided silk tie was then placed with little difficulty around the patent ductus and carried toward the aorta. A small strip of cellophane was then tied around the ductus. Pleural folds were allowed to fall together; the pleural cavity was cleaned of all blood and fluid and 200 cc. of 1:3300 azochloramide and 1:500 sodium tetradecyl sulfate were inserted in the left pleural space. Two Champion silk sutures were placed through the cartilage at the third costochondral junction and tied after the selfretaining retractor was removed. Interrupted Champion silk sutures were then placed around the third and fourth ribs so that when these were tied the ribs were held in position. Before tying the more lateral of these sutures a No. 24 soft rubber catheter was inserted in the pleural cavity. The subcutaneous tissue was closed with interrupted





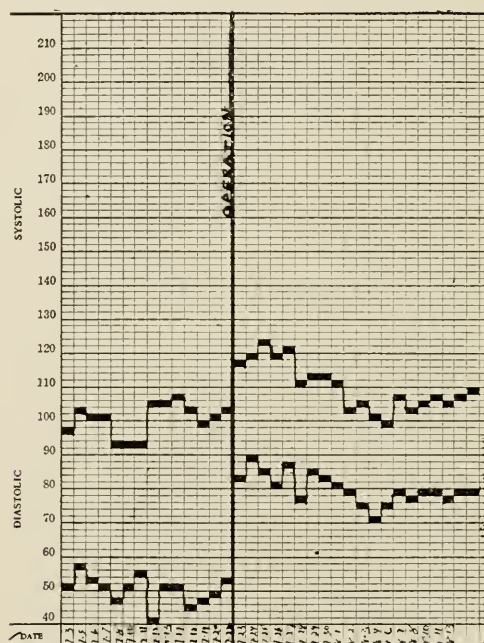
Left: 7-5-44. *Analysis:* Normal rhythm 80. PR 0.14 sec. QRS 0.08 sec. Prominent  $S_{2,3}$ . About equal R & S in chest leads. Inverted T CR-1, 3. *Comment:* QRS changes are probably the result of hypertrophy.

Right: 8-7-44. *Analysis:* Sinu-auricular tachycardia 120. PR 0.14 sec. QRS 0.07 sec. Slight slurring  $S_{2,3}$ . CR-1. Small  $Q_{2,3}$ . CR-5. Low  $T_1$ . Inverted T CR-1, 3. *Comment:* There are slight abnormalities but less than in preoperative record.

Interpreted by Dr. C. E. Leach.

silk sutures; suction was then placed on the catheter and air and fluid were withdrawn from the chest. During this procedure the left lung re-expanded and the breath sounds returned. The skin was closed with interrupted black silk sutures; the catheter was removed and dry dressings were applied. The patient received 400 cc. of fluids intravenously during the operation. When the operation was completed the intratracheal tube was removed. The pulse was rapid but otherwise the patient was in good condition.

*Postoperative course:* On returning to the ward the patient was placed in an oxygen tent, a routine procedure in all chest surgery cases. Following the transfer to her bed she showed signs of impending shock, the pulse rate became rapid and weak, the blood pressure dropped, and her lips became cyanotic. Five hundred cc. of citrated blood and 300 cc. of plasma were given and the patient responded rapidly. The pulse became stronger



were removed on July 28 and sulfadiazine was discontinued on July 31. The patient was allowed out of bed on August 5, the thirteenth postoperative day. A roentgenogram on August 7 showed a decrease in the transverse diameter of the heart from 11.2 to 10.6 cm. There was also a decrease in the supracardiac area. The left diaphragm was slightly elevated. A postoperative electrocardiogram revealed only slight abnormalities and improvement over the preoperative record. The venous pressure and circulation time showed no change following operation. The blood pressure in the left arm taken two weeks postoperatively was 106 mm. of mercury systolic and 80 mm. diastolic, and in the right arm 108 mm. of mercury systolic and 80 mm. diastolic. One month after operation the blood pressure remained at a consistent level and there has been no evidence of recanalization of the ductus. The patient was discharged on August 13, 1944.

#### SUMMARY

The ductus arteriosus has the normal function of shunting blood from the pulmonary artery to the aorta during fetal life when the lungs are collapsed. The persistence of the patent ductus after the first year of life should be regarded as abnormal. The presence of a patent ductus may be compatible with a long and active life in some people; in others this shunt may cause a limitation of growth and an increased cardiac burden with eventual failure, or it may increase the likelihood of superimposed bacterial endarteritis. The life expectancy of this latter group is reduced considerably. The important clinical features of a patent ductus arteriosus are the machinery murmur, the thrill, the roentgenologic findings, low diastolic blood pressure, and the physical underdevelopment of the patient. There are no characteristic laboratory or electrocardiogram findings.

Surgical ligation of the ductus arteriosus is advocated as a means of avoiding the complications to which a patient with a patent ductus is subject. The indications for operation are: the presence of a low diastolic blood pressure; evidence of cardiovascular disturbances; and failure of the patient to develop properly. Contraindications are the presence of other congenital cardiac abnormalities for which the patent ductus acts as a compensatory mechanism. The presence of subacute bacterial endarteritis is not a contraindication and there have been reports of numerous cases of recovery from a superimposed bacterial endarteritis after ligation of a patent ductus arteriosus. From a review of the literature the average surgical mortality was found to be 8.5 per cent in uncomplicated cases. With better operative technic this percentage is probably lower at present. The effects of ligation are: a rise in diastolic blood pressure; disappearance of the murmur and thrill; reduction in cardiac size; and an acceleration in physical development.

A case of patent ductus arteriosus is reported from the University Hospital in which ligation of the ductus was performed successfully.

At the time this article is submitted to the printers more than six months have elapsed since operation. Because of the distance which the patient



must travel to reach this clinic it has been difficult to follow her personally. According to her family physician, however, she has gained almost thirty pounds since leaving the hospital; she has had no cardiac symptoms and the thrill and murmur are still absent.

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## SOME PRACTICAL PHASES OF THE CANCER PROBLEM\*†

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During the past four decades the death rate in the United States has been reduced by approximately 40 per cent and life expectancy has been increased to sixty-four years. These results have been achieved largely through successful efforts in the prevention and treatment of infectious diseases. Thus, the group of infectious diseases of childhood has shown a 91 per cent reduction in mortality; the death rate in typhoid and paratyphoid has been lowered from 35.9 per 100,000 to 1.1 per 100,000; and the mortality rate in tuberculosis has been decreased from 201.2 per 100,000 to 45.9 per 100,000.

Unfortunately, a much less optimistic report must be given in the matter of degenerative diseases of the cardiovascular-renal systems and of neoplastic diseases. These processes at present rank numbers one and two respectively as causes of death. The problem of the control of cancer is, therefore, immediate and challenging.

If it is recognized that the knowledge of cause is a prerequisite to the prevention and rational treatment of a disease, then one of the important obstacles to the solution of this problem is understood. However, the discovery of the specific cause of a particular tumor would not afford an adequate solution, since it is recognized that diseases grouped under the heading of cancer are many and diverse and that the causes must be legion. The only carcinogenic agents known to produce tumor by direct action are certain viruses and these are active only in the lower animals.

Studies on human cancer carried out during relatively recent years have brought to light many factors which may be associated with or which may actually incite the formation of tumors. These include heredity, environment, occupation, social status, habits, diet, endocrine secretions, and previous or concomitant disease.

The attention of laboratory investigators is now focused on the role of chemicals, radium, roentgen rays, and other exogenous substances as carcinogenic agents. A number of these have been identified as causative factors in occupational cancer. The observation of the relation of cancer to occupation was first made in 1775 by Percival Pott, who noted an increased incidence of scrotal cancer in chimney sweeps.

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† Presented at The Meeting of the Allegany-Garrett County Medical Society, October 20, 1944.

At the present time there are 146 different occupations in which exposure to known carcinogenic agents may occur. The known causes of cancer in man include roentgen rays, radium, aniline dye compounds, tar, pitch, petroleum oils, paraffin benzene, arsenic, possibly asbestos, nickel carbonyl, and the chromates.

Aniline dye compounds cause cancer in the urinary bladder. The role of roentgen rays and radium in the production of malignant diseases of the skin, bones, and lungs is well known. The price paid by pioneers in roentgenology because of inadequate protection is readily recalled. The relation of osteogenic sarcoma to radium emanations has been pointed out clearly by Martland in his reports of the occurrence of this disease in persons engaged in painting luminous watch dials.

Some of the most interesting facts concerning the causes of carcinoma of the lung are those dealing with the "Schneeberg lung cancer." For many years it has been known that a considerable number of the workers in the cobalt mines in Schneeberg, Saxony died as a result of lung disease. In an official investigation started in 1922 it was found that 71 per cent of the miners under study died of carcinoma of the lung. During this same period no example of lung cancer was found among persons living in that area but not working in the mines. These miners were exposed to the mechanical irritation of silicon, to a chemically active dust containing arsenic, and to emanations of radioactive substances. Since exposure to silicon and arsenic is not generally related to lung cancer, it is assumed that the rays cast by radioactive matter were the causative factors in the Schneeberg cases. This applies only to isolated groups of persons and cannot be considered as an explanation of spontaneous lung cancer, which in recent years has become a relatively common disease.

Another substance with recognized carcinogenic potentialities is benzene. This chemical is used extensively in industry as a solvent; it is also utilized in the preparation of motor fuel. The action of benzene on the hemopoietic tissue of bone marrow in producing leukopenia is well known. Paradoxically, in some instances, at least, prolonged exposure to the drug has resulted in the development of leukemia. These are but some of the examples of the known relationship between certain industrial exposures and cancer.

It seems likely that the incidence of occupational cancer is greater than indicated by the number of identified cases. The required period of exposure is often a matter of years and the worker may have changed his occupation long before the tumor is evident. Hope for a reduction in the incidence of and the mortality from occupational cancer rests in the proper protection of workers and the periodic examination of those already exposed.

In addition to occupational cancers, there are a number of tumors which



originate on the basis of preexistent or concomitant disease. The importance of so-called precancerous lesions is emphasized by the following statement from a recent editorial in the *Journal of the American Medical Association*: "Generally speaking, the association of cancer with chronic inflammatory and irritating lesions—precancerous conditions—is so close that their prevention and cure are regarded by physicians as all important measures toward the prevention of cancer."

Lesions antedating or associated with the development of carcinoma are most commonly found on the skin but they also occur in many other parts of the body. Xeroderma pigmentosum is a disease of the skin which practically always gives rise to cancer. This is an actinic dermatosis resulting from an abnormal reaction of the skin to sunlight. It is often manifested in early infancy. The disease passes through progressive stages of inflammation and hyperkeratosis; malignant changes of a squamous or basal cell type ultimately supervene.

It is estimated that about 18 per cent of cutaneous cancers of the scalp and extremities develop in scars of old burns or ulcers. Sebaceous and epidermoid cysts of the skin are not to be neglected since it is estimated that malignant changes occur in the linings of these structures in approximately 4 per cent of the cases. Draining sinuses in chronic osteomyelitis, arsenical keratosis, seborrheic keratosis, kraurosis, and lupus are further examples of diseases which predispose the development of skin cancer. The removal or the periodic examination of such lesions is indicated as a means of reducing incidence of epidermoid carcinoma.

Another fertile field for the prevention and early detection of malignancy is the cervix of the uterus. Squamous cell carcinoma of the cervix is the most common type of tumor occurring in the female generative tract. It is encountered almost as frequently as carcinoma of the breast. Cervical cancer is about eight times more frequent in women who have borne children than in women who have not. The cervical tears during childbirth with the resultant infections and erosions must be considered as precancerous, just as is cervicitis with the epithelial hyperplasia and metaplasia incident to repeated attempts at healing. The proper treatment of lacerations and cervicitis will certainly aid in the prevention of cancer. Carcinoma of the cervix is often difficult to recognize in its early phase when the chances for cure are best. The study of the cervix by biopsy is the most certain of the various diagnostic aids. It must be remembered that a negative biopsy may mean that the proper sites for tissue removal have not been selected. The iodine reaction of Schiller is helpful in selecting suspicious areas for further study. This reaction depends upon the fact that normal cervical epithelium contains glycogen and diseased epithelium does not. Thus, when the cervix is painted with an iodine solution the normal mucosa stains

brown while the affected mucosa, malignant or not, remains unstained. If these unstained areas are excised, the chances of finding cancer in the biopsy are enhanced.

The trained pathologist has little difficulty in recognizing unquestionable cancer in a section. However, in cervical biopsies it is not always easy to interpret the meaning of epidermalization and squamous metaplasia where there is no evidence of stromal invasion. These lesions may be merely in response to infection or they may represent cancer in its preinvasion stage. Additional biopsies should be made in all questionable cases and even though they prove negative a careful follow-up is essential.

In cases where it is deemed necessary to remove the uterus for any cause whatever, the decision as to whether the operation shall be supravaginal or a panhysterectomy must be left to the surgeon. It must be recognized, however, that when the cervix is allowed to remain it is a potential source of cancer. From 3 to 4 per cent of all cervical carcinomas arise in remaining stumps. A number of competent physicians agree that the danger of total hysterectomy is less than that of cancer in the cervical stump.

For the most part it is agreed that chronic mastitis in its various forms is a precancerous lesion, but there is no authoritative statement or general agreement as to the frequency of mastitis as an etiologic factor in cancer of the breast. The breast, like the thyroid gland, undergoes cyclic changes of hypertrophy and involution. These changes, if abnormal, may lead to fibrosis, cyst formation, fibrosing adenomatosis, and to the formation of intracystic papillomas. There are no means of accurately determining which lesions will develop cancer and which will not. Warren (1), in a comprehensive study of the problem, estimates that the incidence of cancer of the breast in women with chronic mastitis is from 2.5 to 4.5 times as great as in women with normal breasts. The same author makes the important observation that "once a woman who has developed chronic mastitis reaches menopause, her chance of developing breast cancer is not much greater than that of anyone, but until that time she is in far greater danger of developing breast cancer than is the woman whose breasts have been apparently normal."

From a practical standpoint, and in the light of present knowledge, it would seem that the chances for the development of carcinoma are not sufficiently great to warrant mastectomy. On the other hand, chronic mastitis should not be ignored. The middle course of removal of the involved tissue with subsequent periodic check-up seems to be the logical course of procedure.

The appreciation of the fact that the endocrine glands may play a role in the production of certain cancers dates from some observations made by Lathrop and Loeb (4) on mice. These observers found that if the ovaries

of immature mice from a high mammary cancer strain were removed, the incidence of breast cancer was reduced almost to zero. In women the relationship between the ovary and breast cancer is indeterminate. Unfortunately, ovariectomy and sterilization by roentgen ray treatment in cases of breast cancer have given disappointing results.

A relationship between the endocrine glands and prostatic cancer has been definitely shown by Huggins (3) and corroborated by many others. The treatment of persons with prostatic cancer by castration or by the administration of estrogen has yielded good palliative results. Clinical improvement is reported in more than 80 per cent of the cases so treated. These include an increase in appetite, a gain in weight, decrease in size of the prostatic tumor, and in many cases an immediate and decided relief from the pain.

Periods of regression of the disease for eighteen months to three and a half years have been reported. In a small series of cases of prostatic cancer operated on at the University Hospital no essential difference could be found in the histologic types of cancer in patients who responded and those who did not.

At the recent meeting of the District of Columbia Medical Society, Adair, from the Memorial Hospital in New York, reported significant results in the treatment of carcinoma of the male breast by castration. In a series of ten cases all but one, a thirty-two year old man, showed remarkable clinical improvement. One patient had an ulcerating carcinoma of the breast with widespread metastasis to the bones. Following castration the area of ulceration healed and the metastatic lesions in the bones showed distinct evidence of reossification.

It would, therefore, appear that in some cases of cancer of the prostate and of the male breast the tumors are dependent on androgen for their survival. These facts encourage the hope that similar relationships may be found to exist between other tumors and endocrine secretions and that the application of such knowledge may serve to decrease the mortality of some forms of cancer.

#### SUMMARY

In summary, it can be said that certain factors which may initiate cancer or which may control its subsequent growth are known. The conscientious application of such knowledge will be an important step in the fight against cancer.

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# HEMOTHORAX AND HEMOPERITONEUM FOLLOWING RUPTURE OF VARICOSITIES OF THE DIAPHRAGM\*

## A CASE REPORT

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Although it is customary to precede a case report with a brief review of similar reported cases, a search of the literature has been successful in revealing that little is known concerning the venous circulation of the diaphragm. That the case to be reported presented anatomic findings not described in previous articles is consistent with the diagnostic problems presented by the patient while on the ward.

The apparent inconsistencies in his physical findings were coincident with admission and continued throughout his hospital course. A thoracentesis was performed because of dyspnea and typical signs of pleural effusion; although bloody fluid could be aspirated from several intercostal spaces, the roentgenograms of his chest at that time and even immediately before death were essentially negative. On occasion the patient would show signs typical of a fibrillating rheumatic heart; a few minutes later there would appear the symptoms of a mediastinal mass; still later his condition would indicate a perforating gall bladder, but the heart and mediastinum would appear to be normal. The usual clinical and laboratory aids only served further to confuse the diagnosis; thus treatment was symptomatic and final diagnosis was performed deferred until the answers became obvious.

## CASE REPORT

The patient, a 44 year old colored male, was admitted to the University Hospital on February 14, 1944 with the complaint of generalized pain of six weeks' duration. The onset of symptoms had been gradual; the patient became progressively weaker and, because of the generalized aching and weakness, concluded that he had the grippe. He complained of a constant dull aching pain which involved especially the shoulders and knees. He "hurt all over" but more constantly on the right side than on the left. This pain was not influenced by bed rest or by exercise. Muscle cramps were present in both legs but were relieved by a change of position. Along with the aching the patient had occasional sharp, stabbing pains in his chest and abdomen.

These symptoms gradually became more severe and the patient was forced to go to bed. While at bed rest he had several attacks of nausea and vomiting. The vomitus consisted of partially digested food and bile, but contained no blood. The patient had no other gastrointestinal symptoms, except for obstipation which persisted for four days prior to admission.

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\* Received for publication October 30, 1944.

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Three weeks before hospitalization the patient attempted to return to his work as a porter, but was forced to return to bed because of weakness and pain. Following this he noticed shortness of breath and an unusual heart beat, a sensation which he described as a "quivering in the heart." There was no cough or hemoptysis.

The family history was negative. The past history included a gonorrheal urethritis twenty years ago and pneumonia eight years ago. In 1942 the serologic test for syphilis was found to be positive and antiluetic therapy was begun; after approximately eight months, he refused further treatment.

A physical examination revealed the patient to be a well nourished colored male who showed evidence of some recent weight loss. He was cooperative but disoriented and euphoric. He was moderately dehydrated. The left side of the forehead and face were covered with droplets of perspiration; the right side was dry. His pupils were round, regular, and equal, and reacted sluggishly to light and accommodation. The extraocular movements were normal, except for a nystagmoid horizontal jerking on lateral gaze. The sclera and conjunctiva were clear. The fundus showed a definite increase in the light streak of the arteries and fullness of the veins. There was intermittent hoarseness of the voice, but the pharynx was not injected. The uvula and trachea were in the midline. No tracheal tug was found. A slight glandular enlargement was seen in the neck, but there was no generalized lymphadenopathy. The neck veins were full; no abnormal pulsations were present.

Respirations were rapid and mainly abdominal. The lung expansion was poor. The percussion note was dull over the entire lower lobe of the right lung posteriorly and in the axilla. Breath sounds in this area were distant; elsewhere they were bronchovesicular, with wheezing rales. The diaphragm was fixed bilaterally. The heart was enlarged to percussion, the right border being 5 cm. and the left border 10 cm. from the midsternal line. The apex beat was felt in the sixth interspace at the anterior axillary line. Retromamillary dullness measured 8 cm. There was a coarse presystolic rumble and a loud whistling systolic blow at the mitral area, which was transmitted to the axilla. The aortic sounds were rough, with a loud blow in both phases, and were transmitted to the carotid arteries and down the sternal border. The blood pressure in the right arm was 158 mm. of mercury systolic and 74 mm. diastolic; in the left arm it was 172 mm. of mercury systolic and 70 mm. diastolic. The rate and rhythm were normal.

The abdomen was distended and tympanitic and exhibited moderate muscle spasm. Normal peristaltic sounds were audible. The liver was palpated below the costal margin about 4 cm. in the right midclavicular line. There was definite shifting flank dullness and extreme tenderness in the right lower quadrant. The prostate was firm, nontender, and fixed. There was approximately 15% limitation of function in all joints on passive motion. The deep reflexes in the upper extremities were hyperactive but absent in the lower extremities. Abdominal reflexes were present and there were no abnormal reflexes.

On the day of admission the nonprotein nitrogen level was 69 mg. % and the blood sugar level 144 mg. %; the hemoglobin was 74%; red blood cells 3,370,000; white blood cells 20,100; polymorphonuclears 94%; lymphocytes 4%; and eosinophils 2%. The sedimentation rate was 17 mm.; the corrected hematocrit reading was 26.

Urinalysis was negative except for +2 albumin. A blood chemistry determination on February 17, 1944 showed uric acid 2.2 mg. %, an albumin/globulin ratio of 2.72/3.33, and van den Bergh test 1.4 mg. % direct prompt reaction. The serologic test for syphilis was strongly positive. The results of two blood cultures were negative.

The electrocardiogram revealed notched P waves, slightly elevated ST and late inverted T waves, which suggested rheumatic heart disease with pericarditis. A roentgenogram showed the diaphragm to be elevated, and the aorta tortuous and dilated. The supra-

cardiac shadow measured 7.0 cm. The transverse diameter of the heart was 15.4 cm., the transverse diameter of the chest 28.5 cm.

A thoracentesis was performed on the right side in the fifth, sixth, and seventh inter-spaces in the posterior and midaxillary lines. Bloody fluid was found at each puncture site and 200 cc. were removed. The fluid was sterile on culture and resembled circulating blood; it clotted immediately.

During the four days of hospitalization the patient had transient episodes of auricular fibrillation and of hoarseness. The blood pressure ranged from 120 to 170 mm. of mercury systolic and from 60 to 70 mm. of mercury diastolic. His temperature remained elevated, with a peak at 102 F. The venous pressure and circulation time were within normal limits. A lumbar puncture revealed a clear fluid containing no cells under 232 mm. pressure, a +1 reaction to Pandy's test, and a positive Eagle complement fixation.

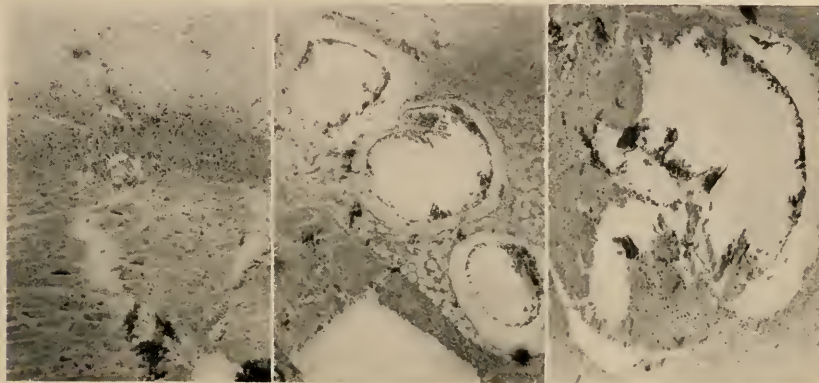


FIG. 1

FIG. 2

FIG. 3

FIG. 1. Large communicating vein connecting varicosities in the superior and inferior surfaces of the diaphragm.

FIG. 2. Three large veins showing degeneration and fragmentation of the vessel wall and surrounding hematoma.

FIG. 3. Two large veins with vessel walls almost completely destroyed and adjacent hematoma.

In spite of all efforts at decompression the abdomen remained distended and the patient showed evidence of early paralytic ileus. The hemoglobin dropped from 78 to 60% on the morning of the third day. On that same day he complained of intense persistent pain in the region of the right clavicle and right upper quadrant of the abdomen. Abdominal muscle spasm was present but no mass was palpable.

In the early morning of the fourth day the patient complained of distention and was given an enema. He was euphoric and disoriented but did not appear in acute distress. While expelling the enema he fell from the bedpan. An examination showed that respirations and heart beat had ceased. Attempts at stimulation were unsuccessful.

*Clinical diagnosis:* Luetic cardiovascular disease with mesaortitis and aortic dilatation; coronary insufficiency; encephalomyeloradiculitis, luetic; possible abdominal aneurysm; atelectasis and pneumonia of the lower lobe of the right lung; hemothorax, right side.

An autopsy was performed seven hours after death. The abdomen contained approximately 800 to 900 cc. of liquid blood and numerous fresh clots. A large blood clot covered the dome of the liver and filled the subhepatic space. Blood was present in both

lateral utters and clots were adherent to the loops of the small bowel. The pelvis was filled with liquid and partially hemolyzed blood.

The right pleural cavity contained 800 cc. of fresh liquid blood which clotted on exposure to air. There were 400 cc. of serosanguineous fluid in the left pleural cavity.

The heart weighed 450 grams. The right auricle was greatly dilated; the wall of the left ventricle was hypertrophied, and measured 2 cm. in thickness. The mural and valvular endocardium appeared normal and the valve orifices were within normal ranges of measurement.

There was a saccular dilatation measuring 6 by 3 by 2 cm. on the superior surface of the ascending aorta. It began proximal to the origin of the great vessels arising from the arch of the aorta and involved the orifices of the innominate, left common carotid and left subclavian arteries. The intima of the aorta in this area was wrinkled and furrowed and presented the typical gross symptoms of luecic mesaortitis.

Both lungs were congested. The lower lobe of the right lung was atelectatic and discolored. On cross section it was edematous and did not contain air. The right main bronchus was compressed by the pressure of the aneurysm.

The kidneys showed depressed cortical scars from old infarcts.



FIG. 4. Partial section of diaphragm showing a group of varicosities.

The other organs, including the brain, showed little of pathologic importance. There was a slight increase in the quantity of cerebrospinal fluid.

The explanation of the massive hemorrhage into the peritoneal and pleural cavities was found in the diaphragm. This was covered on both its superior and inferior surfaces by large dilated tortuous veins. On the right side of the inferior surface there was a localized hematoma where the thin walled vessels had ruptured. The hematoma had broken through the serosa, with resultant hemorrhage into the peritoneal cavity.

There was also a large hematoma on the superior surface on the right side. This was not opposite the clot on the under surface. The hematoma had ruptured through the parietal pleura and bled into the pleural cavity.

A microscopic examination of the heart confirmed the hypertrophy and early interstitial fibrosis of the myocardium was found. The aorta showed scarring of the media, with destruction of the elastic tissue and muscle fibers. Perivascular infiltration in the adventitia and outer media was far advanced.

The lower lobe of the right lung was atelectatic and showed edema and beginning consolidation.

Fibrous replacement of the parenchyma had occurred in the infarcted areas in the kidneys.

An examination of the diaphragm showed a large hematoma on both surfaces. The vessels, which were extremely large and thin walled, were surrounded by a dense mass of



erythrocytes. Large communicating branches extended through the diaphragmatic musculature to connect the vessels on the superior and inferior surfaces. The extremely thin walls of the veins had undergone degeneration, with destruction of all but the endothelial lining. In some areas even the endothelium showed degenerative changes. This degeneration evidently was caused by pressure necrosis from the surrounding hematoma.

The brain showed the usual findings of early meningo-encephalitic syphilis. Inflammatory exudation into the meninges and perivascular infiltration had occurred, with beginning extension into the brain tissue. No gumma was seen.

#### CONCLUSIONS

Much of the confusion in interpreting the clinical course can be cleared by reference to the varicosities of the diaphragm. Undoubtedly, the advanced syphilis was responsible for many of the complaints, both subjective and objective. The generalized pain, the fatigue, the disorientation and euphoria may all be explained on this basis. The sharp precordial pain and the clinical signs of aortic insufficiency were probably caused by luetic mesaortitis and aneurysmal dilatation of the aorta.

The right main bronchus was flattened and almost completely obstructed by the aortic aneurysm, with resulting atelectasis and edema of the lower lobe of the right lung. The signs of pleural effusion are, of course, explained by the massive hemothorax. The features of Horner's syndrome and the intermittent hoarseness are probably attributable to the pressure of the aneurysm in the mediastinum.

It is possible that the abdominal distention and impaired peristaltic action were caused by the presence of blood in the peritoneal cavity.

The diaphragmatic varicosities were probably congenital. The number of vessels and their extremely large size indicate a congenital origin. Though it is true that the aneurysmal dilatation of the aorta and the dilated right auricle did exert some pressure on the vena cava, there was no evidence to show that this pressure was of any significance. The internal mammary, the azygos, the innominate, the left subclavian, and the jugular veins were inspected carefully and no abnormal dilatation or tortuosity was found. There was no edema or ascites, and the venous pressure and circulation time were normal.

Although there was no severe back pressure from impaired venous return, the extremely thin walled varicosities of the diaphragm ruptured. It appears safe to assume that the original rupture was small, forming the localized hematoma around the vessels. This hematoma was under tension and exerted pressure on the veins, with resulting atrophy and fragmentation of the vessel wall. It was followed by massive hemorrhage.

The hemoglobin fell from 74% on the first day to 60% on the third day. The last blood count was taken nearly twenty-four hours prior to death. It

appears almost certain that at the time of death the hemoglobin was much less than 60%.

The hemorrhage was, of course, not the sole cause of death but it undoubtedly was an important contributing factor. The amount of blood lost could not be measured accurately but must have exceeded 2000 cc.

#### SUMMARY

A case of hemothorax and hemoperitoneum following spontaneous rupture of varicosities of the diaphragm has been presented. The presence of the varicose veins in the diaphragm constitutes an unusual lesion. A rather thorough search of the literature failed to reveal any report of a similar case.

# FOWL MITE DERMATITIS (*DERMANYSSUS GALLINAE*)\*

## WITH REPORT OF TWO CASES

E. PAUL KNOTTS, B.S., M.D.

DENTON, MD.

A search of the American literature fails to reveal reports of fowl mite dermatitis, *Dermanyssus gallinae*, though it is likely that this condition has occurred often. It was therefore considered of timely interest to record two cases seen here in the same household.

In 1921 Toomey (5) wrote of several attacks on humans by this mite in Australia and in 1935 it was again reported from the same country by Lawrence (2). An article by Uzida (6) appeared in the Japanese Medical Journal, in which he expressed the opinion that this mite was the vector of relapsing fever. In his book on tropical medicine Stitt (4) barely mentions this parasite and writes briefly: "Poultrymen may be troubled with a sort of eczema on the back of the hands and the forearms similar to scabies, resulting from the bites of these mites."

The facility with which parasites considered to be highly selective in their hosts and environs can adapt themselves to new situations is one of the imponderables. Such an instance was reported by Shelmire and Dove (3) in which was related an invasion of homes, office buildings, theaters, and stores in Fort Worth and Dallas, Texas by the tropical rat mite. It is likely that this parasite has a life history as old as that of its usual host, the rat. Cases of infestations of humans were first recorded in Australia in 1914 and in this hemisphere in 1921. In 1928 it suddenly became an important cause of dermatitis and several hundred cases were reported in that area. This was paralleled by the occurrence of a flare-up of endemic typhus and the authors of this article believed there was sufficient circumstantial evidence to incriminate the mite as the vector.

The fowl mite, *Dermanyssus gallinae*, is a bloodsucking arachnid of the order Acarina, and is grouped under the family Parasitidae along with the rat mite, *Lyponyssus*. It has a wide distribution. Though primarily a chicken parasite, it has been found in bird nests and presumptively could be carried by birds, which may account for its presence in many parts of the world. It is a nocturnal marauder, visiting its host at night and retiring to a selected place during the day. It hides away in dark places, especially about woodwork and the crevices of clothes and bedding, thus imitating the ubiquitous bedbug. Microscopically it is hard to see, being gray in color unless engorged with blood, at which time it can be compared to a grain of pepper.

\* Received for publication November 10, 1944.

When disturbed, and especially if subjected to a strong light, it will move rather rapidly, and this serves to identify it. The body measures approximately 350 by 650 microns.

The fact that any bloodsucking parasite that adapts itself to the human economy may become a vector of disease and that in at least one instance the fowl mite has been accused of that ability, makes it timely to report these cases. The dermatitis itself is of sufficient importance to warrant an alertness to its possible occurrence and to institute appropriate treatment when diagnosed.

#### CASE REPORTS

On March 4, 1944 a 60 year old white female was seen with the complaint of an itchy eruption which was generalized in distribution and resembled scabies in appearance. A sister who shared quarters with her was affected similarly. After a casual consideration of the condition a diagnosis of scabies was made and an ointment containing balsam of Peru was prescribed. However, the patients were not benefited by this treatment. A subsequent investigation revealed that they were infested with a parasite identified as *Dermanyssus gallinae*, or fowl mite. One parasite was removed from the body and several were found in the wearing apparel. At this point one of the patients reported that she could ascertain exactly when the mite was biting and described the sensation as a slight but definite prick followed almost immediately by pruritis of moderate severity. The site of the bite became papular at once and the itching continued indefinitely. Rubbing and scratching of the papule caused it to enlarge and it tended to become more irritating than before. The papules became excoriated easily and blood crusts formed.

The areas of the body affected corresponded to the nocturnal habits attributed to the pest in that the covered parts are preferred. The heaviest infestations were found about the axilla, the breasts, abdomen, nates, and thighs. Only a few affected areas were seen on the wrists, forearms, and legs.

There was no tendency to grouping, which indicated that each papule represented the bite of an individual mite. These parasites do not burrow as does the *Acarus scabiei*. However, in persistent lesions there were indications that the mite became imbedded in sebaceous ducts and sweat glands, was trapped by the inflammatory edema and blood crusts, and apparently died there. Several comedone-like lesions were evacuated but no live mites, larvae or eggs were found. Some fragments of the mite were identified microscopically.

After being identified the mite was traced to its source. Entry had been made into the house on the coat of one of the patients, which she wore while gathering eggs, tending the chickens, and cleaning the coops. The coat was hung in a closet where both patients kept their nightgowns. This closet was found to be heavily infested, as were all articles stored in it, and a few mites were found crawling about the door jamb outside the closet. The bedding in an adjacent room also was infested, the nightgowns probably acting as carrying agents.

The condition strongly resembled scabies in appearance, and the nocturnal element of the itching and the distribution were somewhat similar. However, there were no burrows. In distribution the hands and feet were spared entirely. The pustules usually seen in scabies were not present. It should be differentiated from other bloodsucking parasitic infestations such as pediculosis corporis, fleas, chiggers, bedbugs, and grain mites. The occupation of the patient is significant, but the final diagnosis probably depends upon finding the mite and identifying it.



In the absence of secondary infection treatment largely resolves itself in the elimination of the pest. Locally it is likely that any antipruritic application will suffice.

Prophylaxis which includes a knowledge of infested chicken houses and coops, anointing of the hands and arms with vaseline when handling the fowl that harbor the mites and while cleaning the nests and coops, and the removal and sterilization of the clothing worn is probably sufficient.

The infested clothes and other materials harboring the mites may be boiled or treated with anthracene oil mixed with half its volume of kerosene, or kerosene may be used alone. The same oil and kerosene could be sprayed with a pump to give a strong penetrating treatment to the floors, walls, and especially around cracks in the flooring and side walls. This should be repeated several times at weekly intervals.

The chicken houses should receive the same treatment in addition to a thorough clean-up of the entire premises. Coal tar stock dips are recommended for infested domestic fowl.

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## AN OBSTETRIC CASE HISTORY\*†

### CASE REPORT

The patient, a twenty-three year old colored woman, para 0-0-0-0, was first seen when the pregnancy was of three months' duration. The pelvic measurements in centimeters were as follows: spines 24; crests 27; trochanters 32; Baudelocque's diameter 20; diagonal conjugate 12; intertuberosity 11. The prenatal course was uneventful until the thirty-second week, when abdominal palpation revealed a breech presentation. An attempt at external version was unsuccessful. The procedure was repeated on the next two weekly visits, still without success. A roentgenogram of the abdomen showed a hydrocephalic fetus in a right sacro-anterior position, a frank breech presentation. No further efforts were made to do an external version. The remainder of the prenatal course was normal and the patient was admitted to the hospital at term and in early labor. The fetal heart was heard in the right upper quadrant of the abdomen. A rectal examination revealed the cervix to be undilated and the presenting part 2 cm. above the spines.

*Treatment:* How should delivery be accomplished?

### DISCUSSION

The treatment of a breech presentation should start at approximately the thirty-second prenatal week. Attempts to do an external version should be made between the thirty-second and thirty-sixth weeks. If this is unsuccessful after several efforts have been made, the cause of the presentation should be investigated. Should a frank breech presentation be found after a roentgenogram of the abdomen, further external version should be discontinued because the legs splint the body of the fetus and prevent enough flexion to make an external version practically impossible. The method of delivery is determined near term by roentgen cephalopelvimetry; if there is a disproportion, a cesarean section is done without allowing the patient to go into labor. In this instance the cause of the disproportion was a hydrocephalic monster. If an external version had been successful the patient could have been allowed to go through labor. When the cervix would have been dilated to about 4 cm. a large needle could have been inserted into the cranium and the head would have collapsed after the excessive cerebrospinal fluid had drained off, thus permitting an eventual spontaneous delivery. In a breech extraction of an infant with a hydrocephalic head it is better to sacrifice the fetus than damage the soft parts of the mother. This is usually accomplished by craniotomy on the after-coming head and delivery by the use of destructive forceps. Cesarean section is interdicted because it endangers the mother in future pregnancies.

*Actual treatment:* The situation was discussed with the patient and rela-

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† Received for publication March 1, 1945.

tives and an explanation made of the poor prognosis for the infant regardless of the type of delivery. At their insistence a cesarean section was done. The fetal head was found to be so large that it could not be extracted without extending the incision the entire length of the uterus. Therefore, an opening was made in the head, fluid was allowed to escape, and a fetus was delivered which died several minutes later. The mother made an uneventful recovery, but it must be borne in mind that she was an obstetric cripple.

## MONTHLY MEETINGS OF THE UNIVERSITY HOSPITAL STAFF

At the monthly meeting of the University Hospital staff held on December 21, 1944 the following program was presented:

"Ambulatory Insulin Therapy with Electroshocks in Mental Disorders," by Benjamin Pushkin, M.D., Department of Neurology.

"Iatrogeny in Syphilis," by Leon Freedom, M.D., Department of Neurology.

Abstracts of these papers follow.

### AMBULATORY INSULIN THERAPY WITH ELECTROSHOCKS IN MENTAL DISORDERS\*

BENJAMIN PUSHKIN, M.D.

A group of eighteen cases of severe mental disorders, treated for from three to thirteen months by ambulatory insulin administration following a number of electroshocks, was presented. The technic, immediate reactions, and the ultimate stages of improvement were discussed; criticism and tentative impressions were expressed. While it is premature and, in view of the severity of the cases dealt with, unwise to draw any definite conclusions, the results so far observed have been sufficiently encouraging to justify the combined method outlined as a worthwhile addition to the limited therapeutic armamentarium available.

### IATROGENY IN SYPHILIS†

LEON FREEDOM, M.D.

The iatrogenic neurosis is one of the most ubiquitous of all neuroses. It is the physician-induced neurosis. When a doctor gives a patient a diagnosis around which or because of which he develops a neurosis or psychosis, the condition is known as iatrogeny. If the individual, on the verge of a neurosis or psychosis is given confirmation of the alleged origin or of his fears and suspicions, this diagnosis becomes the precipitating factor of a neurosis or psychosis.

The confidence and trust reposed by a patient in the authoritative knowledge of his physician makes a hasty and improper diagnosis a damaging and sometimes shattering blow to the mental well-being of the patient.

The psychosomatic approach obviates the already existing anxiety of a patient ill with any disease, especially one which carries such severe social implications as syphilis. The somatic complaints of syphilis of the nervous system are protean and often can scarcely be distinguished from those of psychogenic origin. The physician, inexperienced in detecting psychologic factors in his patient's illness, has an extremely difficult job in establishing an exact diagnosis in neuropsychiatric syphilis.

Before any person is told that he has syphilis, a thorough knowledge of the life story of the patient, his symptoms, history and setting in life, a psychologic, physical, and an environmental analysis, in other words, a psychobiologic study is essential.

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## MEDICAL EXPERIENCES IN THE SOUTHWEST PACIFIC\*

COL. GEORGE H. YEAGER, M.C., A. U. S.†

I want to thank all of you for coming here. I came down to the hospital yesterday and, believe me, it was like coming home. It is a cheering sight to see how well you are carrying on and also to note evidence of physical improvements. We have been told what a trying time you have had; how difficult it has been to obtain help, and how hard you have been working. Personally, I was prepared for evidence of a building disintegrating. I must say that the civilian staff that has remained has done a magnificent job. Their loyalty is appreciated by all who are overseas. Great credit must be given to the senior members of the staff who are working harder than they have in years. It makes those of us who are on foreign duty feel better to know that they are holding up so well.

What I have to say about my experiences overseas is going to be general. Most of them will be personal. I do not want you to think of all of them as applying to the 42nd General Hospital. As a Unit the 42nd has been extremely fortunate. We left San Francisco in April, 1942, and after a short stop in New Zealand landed in Melbourne. On arrival we had our first introduction to tropical weather. Naturally, after traveling through the equatorial area we thought that we were going to a tropical zone. We were told that heavy clothing would be unnecessary. We landed on a pitch dark, and, as we learned, typically rainy winter day. We were sent to a staging area called Royal Park. As we marched through one section of the area we were cheered by the sight and sound of an American band. We thought that we were being accorded a hearty welcome. Subsequently we learned that the band was marching from a retreat ceremony and was totally oblivious of our arrival. Actually, our area was quite deserted and barren. It was a city of tents and temporary galvanized shacks, plus the inconvenience of no blankets, no lights, and no beds. We were much annoyed that after such a long journey no one greeted us with "Welcome." An Australian appeared and told us where to obtain blankets. Pinned to the door we found a sign which we later discovered personified Australian habits. It read "Out to tea."

This was our home for six weeks. Being near a zoo the cacophony of lions, tigers, and monkeys formed a constant background for our activities. Colonel Pincoffs was the only one who braved a shower under the semifrigid conditions and he had to be hospitalized! The majority of us spent as much time as possible in Melbourne, where the amenities were more comforting.

\* This is an incomplete transcript of the address presented at the monthly meeting of the University Hospital Staff, January 18, 1945. The full length report will be filed with the historical records of the 42nd General Hospital.

† Commanding officer, 42nd General Hospital.

Our nurses were separated from us in Melbourne and were sent to Canberra, which is the capital of Australia. I imagine that it now has the status in Australia that the city of Washington had here a hundred years ago. It was created out of a wilderness. Many Australians, particularly those from Melbourne and Sidney, have little national affection for their capital. Actually, it is potentially a beautiful city, planned on a grand scale. In it there was a hospital under construction and we were slated to move into it.

We remained in Melbourne six weeks. I do not know whether you remember, but it was about that time that the Coral Sea battle occurred. The Japs lost quite a few aeroplane carriers and it was thought that the midportion of Australia would be comparatively free from air attacks. With the improved military position our plans were changed and instead of being shipped to Canberra we were sent to Brisbane.

Perhaps you are wondering why I am using definite names of places. I do not know whether or not you are aware of it, but censorship regulations have been modified now that we are definitely in the backwash of activities. It is now permissible to specify our present location. I hope that soon we will move to a more active and more interesting zone.

After arriving in Brisbane we learned that we were to move into a convent school. We were delighted to have any kind of a building. We were elated, particularly since we had contacted units that had been inactive since their arrival overseas three to four months previously and still had no idea of when they were going to start to work. We worked at a rapid tempo. There were no hospital beds set up and casualties were coming in from the north. Until our arrival there had been no adequate medical facilities in the Brisbane area. We were given five days in which to establish a hospital before receiving patients. I do not know whether or not you realize the handicaps of being put into a four story brick building with no elevator and no facilities. There were beautiful verandas and a magnificent view. Located on a high hill, we could see the sea and many islands and sand dunes. It overlooked the city itself. With tropical foliage the view was magnificent; however, from the utilitarian viewpoint of a hospital everything was lacking. When we received our first consignment of patients they had to be admitted through a window on the ground floor. We would place the canvas litters along the corridors and from there corps men would carry the patients up four flights of stairs.

Our equipment had been shipped on a freighter which ran aground and broke in two about twenty miles outside of Brisbane. As a result, our equipment was lost. Later, over a period of months we managed to salvage a great portion of it. Needless to say, this entailed many heartaches as well as hard work.

I doubt whether you know how units are sent overseas. We were given a code number and temporarily forgot the designation of "42nd General Hospital." The Surgeon General's Office in Washington, long before we were sent out, ordered "one 500 bed general hospital, equipment complete." So in theory we should have received at our designation all the equipment, instruments, and drugs necessary to run a hospital of the size indicated. Shipping space was critical. Equipment was scattered on various ships. The constant submarine menace and change of plans often resulted in ships going to undesignated ports. The end results were multiple; some equipment went north, some south, some reached us, some never did, and, as previously mentioned, much of it was lost practically within sight of the hospital.

It was imperative that we have beds. By way of comparison it is like having a sudden air raid in a city with 1000 casualties. It then becomes not a question of whether you can or cannot accommodate patients—you do accommodate them in the best way that you know.

The water supply was inadequate. The Australians had been depending on rain water for utilitarian purposes. It was collected in large underground tanks. We found all the water contaminated. The sewage system was antiquated, toilets sparse, and septic tanks inadequate. The water pressure was low and often failed. In addition to hospital facilities, this building also temporarily housed the officers and nurses.

The nurses deserve the most praise for fortitude. Those on night duty had a particularly trying time. When we would receive notification to expect a group of patients, we would often have to move the nurses out of bed and set up their sleeping quarters as a ward. These exact conditions did not continue, but we worked under great pressure for one and a half years. In the beginning all of our facilities were inadequate. I believe that I wrote to Dr. Shipley concerning some of our experiences. Our operating room was about eight by twelve feet, with no screening. We were living in a land of pests, and when I say pests I mean *pests*! Moths, flies, insects of all varieties, and mosquitoes. We used muslin and gauze to screen the windows and did the best we could. In the first operations performed we had to work with eight Kelly clamps and six Halsted's, and major surgery had to be performed under these conditions. I thought at the time that if Miss Aitkenhead knew she would be delighted. When I recalled the number of instruments we required at home and the number we were working with here, even for intestinal resections, I thought that once she knew she would probably make us curtail our demands when we return.

The 42nd established a fine reputation for itself from its inception as a hospital. Responsible headquarters realized that despite the physical handicaps and immediate lack of certain essential equipment, patients were being given excellent care. We were proud of the attitude of officers, en-



listed men, and most of all the nurses. Many patients have written to thank us for the excellent service rendered, and have commented on the sensation of individual care and attention given them as contrasted to the adequate but routine G. I. service. Most of the credit for such a reputation is attributable to our splendid nurses and corps men.

After we had been in Stuartholme for more than a year our major physical handicaps were overcome. We had a utility room, elevators, and two beautiful operating rooms with large bay windows that overlooked the city and hillside covered with semitropical vegetation. We had used the surgical pavilion about two weeks and then were ordered to move. That is typical of Army or military experience. As soon as adequate facilities are developed in a given location, and if the war is progressing satisfactorily, units move further forward.

The Unit was activated in April, without having had any real military training. It was shipped overseas in May and was functioning as a hospital in July. That is rapid action. So often a unit is given five to six months' training in order to orient itself in administrative matters and military procedures, "red tape to you." We moved into a building without adequate facilities for surgery, X-ray, and other types of service. To give you a specific example of a more or less major difficulty, what electrical equipment we managed to obtain was of 110 voltage and the Australian current was 220 volts. Transformers were practically unobtainable. After many delays we managed to obtain some and to improvise others.

No sooner had we moved into Stuartholme, and before it had been established in its entirety, we were confronted with the problem of not having enough beds for acute cases. A second section was opened immediately. It was called the Columbia Convalescent Section and was located out in the Australian bush about twenty miles from the main section. It was a hospital of tents with a few semipermanent buildings. As soon as Stuartholme patients were ambulatory and able to feed themselves they were sent to the convalescent section. Stuartholme had to be kept mobile.

Facilities were inadequate for the care of psychotic patients, and in order to meet the increasing demand a portion of an Australian hospital for mental diseases was established as a third section.

We had been organized as a 500 bed Unit and at that time functioned in three widely separated areas, with resultant duplication of administrative staffs and headquarters. Gradually the three sections became well integrated and organized; nevertheless, when the order was received to move on we were both relieved and grateful.

The Holland Park site, our present location, originally was planned for two separate 1000 bed hospitals. We first moved into Section I and then, as the demand for beds increased, into Section II, eventually setting up 2100



beds. We moved the various types of patients in the following order: (1) convalescent; (2) psychotic; (3) acutely ill. This sequence was followed in order to utilize convalescent patients to help set up beds and care for those more acutely ill. The moving of large groups of patients into a hospital not completely constructed and with a minimum of personnel presented many problems.

While at Stuartholme we were requested to organize from our staff a twenty-five bed portable hospital. One of the most serious problems presented under combat conditions in New Guinea was the inability to render proper medical and surgical care to front line troops. The geographical disadvantages of tropical heat, dense jungle growth, and steep mountains were so great that the average white person could carry little. Native carriers, "fuzzy wuzzies," were used to carry the wounded from forward areas. They improvised their own litters because ours were impractical over such terrain.

Under such conditions it was found that it was impossible to render proper care to battle casualties, because days might elapse before the wounded could be transported to the rear. To solve this problem small portable hospitals were organized. Each of these was composed of twenty-five enlisted men and four officers. The Unit from the 42nd was known as the Third Portable. The original staff comprised Major Garlick as commanding officer, and Captains Long, Müller, and Karns. These men, all of whom volunteered for the assignment, deserve a tremendous amount of credit for their splendid work. In theory the Unit was to be entirely portable and, at the same time, have enough equipment to set up twenty-five beds, perform major surgery, and expand with more beds if necessary. Transportation facilities were out of the question. Much improvising was required and many modifications of the original idea had to be made. I am sure as members of the Unit come home they will be willing to relate some of their experiences. There is no single group that has done a more creditable job. At times they functioned in combat areas, with mortar fire and bombs dropping nearby.

These Units participated in the major military operations of the Southwest Pacific, including the Philippines. They served the necessary function of giving essential care near the forward lines, with the resultant saving of many lives.

Many problems confronted us, for which we had little or no preparation. When taking my State Board examination I remember being asked about certain tropical diseases. My immediate reaction was that it was a poorly selected question and that I would probably never see such conditions. How wrong I was! After going overseas many of us regretted that we were not better informed about tropical diseases. Immediately, with the reception of patients, we found that with every admission, no matter what the

diagnosis, complicating factors of one or more of the tropical diseases had to be considered. This was particularly true in the early phases of our experience, most of them at least having malaria. General Patterson will agree, I believe, with the impression that most people, if they live in the tropics for a long period, will eventually develop malaria. We were somewhat slow in developing satisfactory policies. Surgically many of us became more cautious than usual. Chills and fever often associated with abdominal pain is not a reassuring experience when it complicates clean surgery. Having been trained under Dr. Shipley, who prides himself on his pessimism, we would think in terms of peritonitis and other surgical catastrophes rather than in terms of tropical disease.

It was noted that physiologic changes in an individual who had been in tropical areas would often precipitate evidence of malaria. This factor could vary from being given an anesthetic to the simple acts of swimming, flying, drinking alcoholic beverages, and similar activity.

In the early phases of our experience there were but two infantry divisions in our sector, the 32nd and 41st. Apropos of those divisions I would like to impress upon you certain facts. There is a great deal of discussion about the length of time troops have been overseas. Friends write that it is time we were coming home and, believe me, that is what we would enjoy doing. We too feel that we have been away a long time. However, do not think that we are unique. Thousands and thousands of boys are overseas who have been there longer than any of the members of the 42nd and have had a much, much worse time. There are many soldiers, sailors, and marines, including the two divisions previously mentioned, fighting in the Philippines today who have fought during a period of three years through the major campaigns of the Southwest Pacific. Needless to say, they have fought and lived under some of the most abominable conditions in the world. The fates have been infinitely more kind to us; nevertheless our destinies are bound closely to theirs. It is difficult to develop much sympathy for our plight when aware of theirs. There is much discussion about the so-called rotation policy. Actually, it is proving to be a slow, laborious policy and by no means is it satisfactory. It is an extravagant policy whereby highly qualified and trained men are lost to their units. Personally, I would be delighted to see it replaced by a more liberal furlough policy.

We must reeducate ourselves to understand that we are not unlimited in such resources as manpower. We have men in great numbers on all world fronts. These men are highly trained. They want to and should see their job through. We should realize that we neither have the ships nor men to permit of a constant interchange of personnel. After seeing the marines go through the New Britain campaign, and now the Philippine one, we have been particularly fortunate. As General Patterson said, we are located in a

salubrious climate. In addition, we have been busy and possess the feeling of having done something worthwhile. The average soldier is having an extremely rough, uncomfortable, and unfortunate experience. Since returning home I have again realized the emphasis placed on the European phase of the war as contrasted to the Pacific, and the lack of comprehension of distances involved. Strangely enough, many individuals are bewildered over the fact that the war with Japan has lasted more than a year or two. After being overseas a short time we fully realized that the Pacific war would last years and, also, that until the European picture improved we would receive but few supplies and fewer men. A long time elapsed before we received other than a minimum of equipment. One of the most difficult problems presented was the lack of facilities for evacuation of patients home. Transport ships could carry small groups of patients in their hospital sections but otherwise, until recently, nothing more was available. The uncertainties of evacuation often resulted in considerable accumulation of patients awaiting transportation. During one phase we had more than 300 psychotic patients awaiting evacuation. Imagine the strain on our duty personnel!

Regardless of such conditions, patients continued to arrive and we had to open new wards constantly and be ready for emergency expansion. Maneuvers were required that were similar to a checker game. The demand for beds would be so great that we would ship patients to hospitals further south, only to have them return to us later when en route to the States. This frequently would entail an extra journey of as much as 1500 miles.

Insofar as professional problems are concerned, you are probably more interested in those peculiar to the climatic conditions that apply. The principal medical problems of the Pacific area are malaria, dengue, typhus fever, filariasis, and the dysenteries. They are not named in order of importance. Malaria is the most prevalent of these conditions. In the early phases of the war it practically incapacitated entire units on duty in the tropics. Postwar statistics will be astonishing. We learn by experience. Rigid programs of malaria control are now enforced, with a resultant lowering of morbidity statistics. Now that D. D. T. has been developed and is being used as a preinvasion spray, the incidence of most of the diseases mentioned should be much lower.

Another condition frequently seen, but which is not as serious, is dengue fever. It is often characterized by a chill and rash, followed by painful joints. The joint symptoms may be of such a character as to simulate rheumatic fever. The acute episode lasts about five to seven days. This is followed in some individuals by a phase of depression requiring long convalescence. Typhus fever, as we saw it, occurred in two principal forms. One type that causes myocardial damage frequently is fatal. One hospital



unit in the Southwest Pacific area lost three of its officers from typhus fever. Exhausted troops will, unless specifically cautioned, lie down anywhere to obtain rest. The tall kunae grass that is characteristic of the tropics is a splendid environment for the mite that causes typhus.

Filariasis is endemic in the islands east of Australia. It apparently does not occur or is rare in Australia and New Guinea.

With regard to venereal disease, I am not informed to what degree treatment has been modified at home. Many modifications have been instituted in Army hospitals. In the early phases of our military experience we usually had one to two wards of gonorrhea cases. Among these there would always be several patients who had been under treatment for months because of a chronic phase of the disease. These patients now average about three days in the hospital and the treatment of many of them as outpatients is being contemplated. Penicillin is the drug of choice and for economical purposes out-dated lots are used. The Army has eliminated the pay penalties formerly associated with this condition.

From the viewpoint of genito-urinary problems in general we believe that there is a higher incidence of urinary calculi associated with living in the tropics. Dehydration is probably a factor. A large number of comparatively young patients are being seen with calculi. Many Australian and English doctors confirm this observation.

One of our most vexing problems has been that of pilonidal sinus. Dr. Shipley usually treated this condition by packing and leaving the wound open. I believe that he still uses that method. We have tried every conceivable type of surgery—packing, suturing, and other methods, and we have found the results uniformly unsatisfactory. As a result of elective surgery many soldiers were, for a comparatively minor condition, disabled for months; some, because of retarded healing and the recurrent breakdown of tissue, were sent home. I do not believe that it had anything to do with improper removal of tissue, or closing, or leaving the wound open. The experience was universal in our area and was probably attributable to the effects of tropical heat. After being discharged from the hospital they had to wear uniforms and ride over rough roads in jeeps and trucks; as a result, the tender tissue would break down promptly. They were often back in seven to ten days after this discharge for further care. We now treat them conservatively with heat, and incision and drainage when indicated. We do not attempt to "cure" them. It is reasoned that since they had the condition prior to induction in the Army without being disabled, it is inadvisable to risk the loss of many manpower days. Use of the newer drugs did not increase the incidence of successful results. When General Rankin inspected our hospital he reported that he found our experience to be similar to results encountered in Africa and India.



One of the major problems presented is that of homesickness, and the longer one remains overseas the greater it becomes. Individuals worry about their families. Financial difficulties, illness, and the death of relatives all play their rôles. Functional elements must always be evaluated properly in each patient. Under civilian conditions the lines of demarcation in determining functional diseases are usually clearer. After being overseas for three years it becomes a problem of paramount importance and increases in proportion to the element of time involved.

The incidence of dermatitis and various types of skin infections is extensive. It is so great in some areas that large sections of hospitals have been designated to treat this condition. Fortunately, most of these patients recover when moved to a more temperate climate. Many of the skin conditions seen are complicated by fungi infections. Tropical areas present a wealth of material for the study of skin diseases. I understand that the 142nd is having a similar experience at their present location and that young Harry Robinson is thoroughly enjoying the clinical material available.

Avitaminosis in certain areas has presented a serious problem. We picture the tropics as areas of lush growths, beautiful flowers, cool drinks with ice in them, and usually rum. Undeveloped tropical areas are nightmares of discomfort. It rains for many months of the year; tents rot and disintegrate; shoes turn green with mold in two or three days if not worn. All water is potentially contaminated; the dysenteries are a constant menace, and tinned food becomes most monotonous. Water, even for washing, often has to be rationed. For example, many nurses in the forward areas were rationed a helmet of water a day for bathing purposes. Insects of all varieties are constant companions, day and night. Refrigeration is non-existent or extremely limited, and in the same proportion so are vegetables and meats. Powdered milk and dehydrated eggs are furnished generously.

The exaggeration of these conditions results in vitamin deficiencies. Without supplementation they will develop scurvy, beriberi, or some manifestation of avitaminosis. One visualizes the picking of fruits indiscriminately from trees in the tropics. General Patterson can amplify on that since he spent much time there. Fruit that is available is what man has raised and not what is found indiscriminately.

To give you an idea of the insect possibilities I will cite a personal experience. When on a trip and after flying from 4:00 A.M. until noon, we were very, very hungry. One of the interesting contrasts of flying in the tropics is that one goes to sudden extremes of heat and cold as a result of high altitudes. Summer khaki clothing does not add to your comfort when flying, but when landing the combination of hot aeroplane engines and tropical heat creates an urge to shed the little clothing that is being worn. This urge, I must admit, becomes the accepted costume in many forward

areas where females are unknown. However, not to digress further, we landed at an isolated outpost for lunch. Upon alighting from the plane I noticed that the back of a fellow officer's shirt looked rather dirty. A closer inspection revealed that his back was covered by hundreds of flies. Such experiences sound like gross exaggerations. However, we visited certain areas where as soon as one steps off a plane one's face and body become covered with flies and numerous insects. They get into the corners of the eyes and mouth, in your nostrils and ears, and all over your face. Both hands are continually busy brushing them away. They are not like the flies at home, where any movement will cause them to take flight. These literally have to be knocked away. We were to eat at an Australian Army mess. The post was a desolate one and any pretense at screening had been abandoned. Besides, some Australians still believe such a measure is a fad and that it excludes air. As a result of this lack of protection, the food was covered with flies. One of the unfortunate dishes they had was rice and raisins. Needless to say, we lost all idea of eating. The insect problem in the tropics is of tremendous importance. There are innumerable varieties of insects and they are constantly present. Mosquito bars for sleeping are requisite. Your reaction may be calmer than mine; just one buzzing keeps me awake. Sandflies, moths of all types, flying cockroaches, and ants are invariably present to add to the comforts of living.

In malarious areas sleeping under a mosquito bar is enforced rigidly as a control measure. Preventive medicine is by far the major problem in tropical areas, and strictly enforced precautionary measures with every individual are the keynote of success.

The bizarre occasionally influenced control measures. It was found that many soldiers failed to take their suppressive drug against malaria, although it was issued to them. Subsequent investigation revealed that they were discarding it because of the belief that these specific drugs interfered with their libido. Malaria was preferable. Control measures have been strict since these early experiences, even to the point of watching individual soldiers swallow their tablet and then having them open their mouth to ascertain they have not hidden the drug under their tongue. Educational movies and lectures have had a splendid effect and now that everyone realizes the importance of such measures, cooperation with medical programs has been excellent.

In the early phases of the war such issues were vital and many of them almost sealed our fate. Strategically, we were moving rapidly in reverse. We were short of everything including manpower. Thus, the problem of preventive medicine became of even greater importance. Certainly it helped turn the tide at a time when it appeared that the Japanese would overrun Northern Australia. At one phase there was little available to prevent such an occurrence.

One hears stories about Japanese atrocities and many of you probably believe they are exaggerated. Possibly some are; however, the majority are true, and in many instances you have been spared the entire bitter picture. I am sure that you have difficulty in appreciating the problem of Japanese aggression and its implications. Defeat by them, among other things, would have meant a form of economic slavery. You may as well realize that the men who have come in contact with the Japanese hate them bitterly and are going to continue to do so even after the war has ended. Personally, I hope that they do. It will help the nation as a whole in dealing with them realistically when the day arrives for peace talks and terms.

Good luck and thanks for the pleasure of seeing you!

### February Meeting

The monthly meeting of the University Hospital staff held on February 15, 1945 was arranged by Dr. Grant E. Ward of the Department of Oncology.

Dr. E. R. Shipley, resident surgeon, presented an arrested case of indifferentiated carcinoma of the cheek in a four year old colored girl. The tumor was implanted with radium needles in November, 1943 and the growth sloughed off leaving a large defect without evidence of recurrence. Plastic repair is now being carried out by Dr. E. A. Kitlowski, Associate Professor of Plastic Surgery, who also discussed the case.

Dr. Ward presented a paper on the diagnosis and treatment of adamantinomas of the jaw. These are tumors arising from embryonic rests and the enamel organs. Other epithelial tumors are closely related to adamantinomas and become malignant. A great many of these tumors have been studied in the Oncology Clinic. It has been found that the most permanent results have been obtained by radical resection of the jaw; any operation short of this procedure risks recurrence.

The method of making prostheses to fill dental defects resulting from jaw resections was discussed by Dr. Riley S. Williamson of the School of Dentistry, with a demonstration of one case.

PROCEEDINGS  
of the  
University of Maryland Biological Society

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*Officers of the Society*

Emil G. Schmidt, *President*  
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Baltimore, Md.

F. Gaynor Evans, *Treasurer*  
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Glenn S. Weiland, *Secretary*  
School of Medicine  
Baltimore, Md.

Ronald Bamford, *Secretarial Representative*  
Department of Botany  
College Park, Md.

*Councilors*

Thomas C. Grubb  
Robert H. Oster  
William E. Hahn  
Walter L. Hard

At a business meeting of the Society held on November 29, 1944 the following officers were elected:

*President:* Dr. Emil G. Schmidt

*Secretary:* Dr. Glenn S. Weiland

*Treasurer:* Dr. F. Gaynor Evans

*Councilor:* Dr. Walter L. Hard

*Secretarial Representative at College Park:* Dr. Ronald Bamford

The following candidates were elected to membership:

*Full membership:* Dr. H. K. Iwamoto

*Associate membership:* Miss Audrey Funk

**ONE HUNDRED AND THIRTY-NINTH PROGRAM MEETING**

The One Hundred and Thirty-Ninth Program Meeting was held on Wednesday, December 20, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

The following program was presented:

"Studies on the Fermentation of Sorbitol by Oral Micro-Organisms," by Thomas C. Grubb, Ph.D., Department of Bacteriology, School of Dentistry, University of Maryland.

"Fluorescence Studies on Cancer IV. The Red Fluorescence of the Mucus of the Forestomach of Mice," by Frank H. J. Figge, Ph.D., Department of Gross Anatomy, School of Medicine, University of Maryland.

Abstracts follow.



## STUDIES ON THE FERMENTATION OF SORBITOL BY ORAL MICRO-ORGANISMS

THOMAS C. GRUBB, PH.D.\*

A quantitative estimation was attempted of the number of individuals whose saliva contains sorbitol-fermenting micro-organisms, and the percentage of sorbitol fermenters in the saliva. The technical difficulties involved in such a procedure probably invalidated the results obtained.

By inoculating 122 samples of saliva in nutrient or trypticase broth containing M:10 concentrations of sorbitol, sucrose and dextrose, the pH and titratable acidity developing in these cultures incubated for twenty-four hours at 37 C. under aerobic conditions were determined. Sorbitol was fermented much more slowly than either of the other sugars and seldom reached a pH of 5.0.

Fifty-five samples of saliva were incubated in a modified Brewer's thioglycollate medium for anaerobic cultivation and the developing pH values determined. Sorbitol, sucrose and dextrose in M:10 concentrations were placed in this medium and the sorbitol was found to be fermented much more slowly than the other sugars.

Strains of *L. acidophilus*, oral streptococci, yeasts and mixtures of yeasts and *L. acidophilus* were inoculated into trypticase broth containing M:10 concentrations of sorbitol, sucrose and dextrose. These test organisms were also inoculated into a modified thioglycollate medium containing M:10 concentrations of the above sugars. In all cases sorbitol was fermented more slowly than the other sugars.

The practicability of employing sorbitol as a substitute for sucrose or dextrose in the sweetening of foods, beverages, confections, and similar items was discussed. On the basis of these in vitro studies it is suggested that in view of the slow fermentation of sorbitol it might be useful in the prevention or control of dental caries.

## FLUORESCENCE STUDIES ON CANCER

## IV. THE RED FLUORESCENCE OF THE MUCUS OF THE FORESTOMACH OF MICE†

FRANK H. J. FIGGE, PH.D.‡

It was observed that the forestomach in rats and mice became red fluorescent when these animals were maintained on a diet of fox chow. This part of the gastrointestinal tract in these animals is relatively susceptible to induced neoplasia. Little or no red fluorescence was observed in the forestomach when mice were fed dog chow, white bread, or peeled boiled potatoes. The materials that caused the red fluorescence of the forestomach originated from two main sources:

1. The chlorophyll and porphyrins resulting from the degradation of chlorophyll in the diet.

2. The porphyrins in the red fluorescent harderian gland secretions that passed to the stomach via the nasolacrimal duct, nasopharynx, and esophagus.

The porphyrins from these sources or porphyrins artificially added to the diet had a tendency to accumulate in the mucus of the forestomach but not in the mucus of the glandu-

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\* From the Department of Bacteriology, School of Dentistry, University of Maryland.

† This work was aided by grants from The Anna Fuller Fund and The International Cancer Research Foundation.

‡ From the Department of Gross Anatomy, School of Medicine, University of Maryland.

lar stomach. The methylcholanthrene when fed with dog chow was also observed to accumulate in the forestomach mucus, but this was not further investigated. A pH difference or gradient resulting from the secretion of acid at the pyloric end of the stomach was found to be responsible for this differential diffusion of porphyrin into the mucus of the two parts of the stomach. This differential diffusion of porphyrin into the mucus was thought to be related to the pH solubility curves of the porphyrin. When the pH of the alimentary content was within the range of minimum solubility of a given porphyrin, the rate of diffusion of the porphyrin into the mucus was greatest.

The conditions existing in the achlorhydric stomach of man were compared to those observed in the forestomach of mice. These data were regarded as additional evidence in favor of the hypothesis that abnormally high concentrations of porphyrin have an influence on cancer susceptibility. The significance of these observations and the final proof or disproof of the hypothesis which assigns to porphyrins an etiologic rôle in the development of malignancy must, however, be left for future investigations.

### ONE HUNDRED AND FORTIETH PROGRAM MEETING

The One Hundred and Fortieth Program Meeting was held on Wednesday, January 25, 1945, at 4:00 P.M. in the Bressler Lecture Hall.

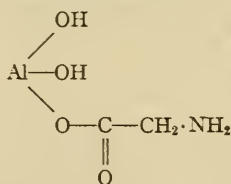
The program consisted of a paper on "Neutralization of Gastric Acidity by Basic Aluminum Aminoacetate," by John C. Krantz, Jr., Ph.D., Dorothy V. Kibler, and Frederick K. Bell, Ph.D., Department of Pharmacology, School of Medicine, University of Maryland.

An abstract of this paper follows.

#### NEUTRALIZATION OF GASTRIC ACIDITY WITH BASIC ALUMINUM AMINOACETATE

JOHN C. KRANTZ, JR., PH.D., DOROTHY V. KIBLER, AND FREDERICK K. BELL, PH.D.\*

It occurred to the authors to attempt the preparation of an aluminum salt of an amino acid which might give the dual effect of immediate acid neutralization by the amino group and secondary prolonged buffering of acid by the metathesis of the aluminum salt of the amino acid and the strongly dissociated hydrochloric acid. Accordingly, aluminum dihydroxy aminoacetate was prepared which had the following structure:



The compound was found to have a prompt and prolonged buffering effect on acid and to be useful in the treatment of hyperacidity and peptic ulcer. On the basis of the aluminum content, basic aluminum aminoacetate is 42 per cent more efficient in acid-consuming power than dried aluminum hydroxide gel.

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\* From the Department of Pharmacology, School of Medicine, University of Maryland.

**ONE HUNDRED AND FORTY-FIRST PROGRAM MEETING**

The One Hundred and Forty-First Program Meeting was held on Wednesday, February 21, 1945, at 4:00 P.M. in the Bressler Lecture Hall.

A paper on "The Present Status of the Hemoglobin-Saline Problem" was presented by William R. Amberson, Ph.D., Department of Physiology, School of Medicine, University of Maryland.

# ALUMNI ASSOCIATION SECTION

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The names listed above are officers for the term beginning July 1, 1943 and ending July 30, 1945

## SPRING ACTIVITIES

The Board of Regents, the President, and the Board of Directors of the Alumni Association, together with the Dean and the Faculty of the School of Medicine of the University of Maryland, cordially invite you to attend the spring activities.

## PROGRAM

June 21, 1945

- 9:00 A.M.—Registration at the Students' Lounge, first floor, Gray Laboratory.
- 10:00 A.M.—12 M.—Inspection of University Hospital and School of Medicine.
- 1:00 P.M.—Luncheon and Annual Meeting of the Medical Alumni Association, Students' Lounge, first floor, Gray Laboratory.
- 7:00 P.M.—Annual Banquet and Dance, Lord Baltimore Hotel.

## REUNIONS

The following classes have expressed their intention to hold reunions this year:

1895	1910	1930
1900	1915	1935
1905	1920	1940
	1925	
	228	



NOTE: The reunions will include the graduates from the College of Physicians and Surgeons, University of Maryland, and the Baltimore Medical College. Any other classes desiring to hold reunions will please communicate with the Medical Alumni Office, Lombard and Greene Streets, Baltimore 1, Maryland, which will be pleased to help in every possible way to make the affair a success.

June 22, 1945

8:00 P.M.—Commencement Exercises, Lyric Theatre, Baltimore, Md.

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*Secretary of the Medical Alumni Association.*

Kindly send . . . . . ticket . . for the Alumni Banquet and Dance of the Medical Alumni Association, University of Maryland, to be held at the Lord Baltimore Hotel on Thursday evening, June 21, 1945 at 7:00 P.M.

will

I *or* be present for the banquet.

will not

Enclosed please find subscription at \$4.00 per ticket.

Name . . . . .

Address . . . . .

(Detach and mail to: MEDICAL ALUMNI ASSOCIATION  
Lombard and Greene Streets, Baltimore 1, Md.)

Programs may be obtained at the time of registration.

## NEWS FROM THOSE IN THE ARMED FORCES CITATIONS AND AWARDS

### LEGION OF MERIT

Col. M. C. Pincoffs, Professor of Medicine, recently was awarded the Legion of Merit for malaria control experiments.

Colonel Pincoffs has been named chief of public health for Manila. It has been announced that thirty-eight hospitals, most of which are under American Army control, are operating within metropolitan Manila.

### TYPHUS COMMISSION MEDAL

Major Theodore E. Woodward, Class of 1938, has been awarded the United States Typhus Commission Medal for exceptionally meritorious service. The citation stated that the award was presented for "activities covering a wide range of original scientific work and administration responsibilities carried out with intelligence, energy, tact, and devotion to the cause of the protection of the military forces against typhus.

"At Casablanca, Morocco, Major Woodward, arriving with the invasion forces in 1942, instituted at once cooperative studies with French scientists at the Pasteur Institute with a view to the control of the epidemic of typhus.

"As a member of the Typhus Commission, he participated actively in the combat against typhus at Naples and in the Aden Protectorate. Finally, in a position of high responsibility he has been a representative of the commission in the European theater, rendering services to military and civilian agencies before and during the invasion of Europe."

For his work at Casablanca Major Woodward was decorated with the Order of Ouissam Alaouite by the Sultan of Morocco.

#### SOLDIER'S MEDAL

Capt. Lester H. Caplan, Class of 1940, was cited for heroism by his commanding general and awarded the Soldier's Medal when he helped to save flyers trapped in a bomb-laden plane that crashed and burned. He managed to get the injured away from the exploding ammunition and to safety before the bombs exploded.

#### BRONZE STAR MEDAL

Capt. Seymour Sacks, Class of March, 1943, has been awarded the Bronze Star Medal for "providing the most efficient medical care for the men in the battalion of which he is medical officer, while at the same time maintaining a high hygiene and sanitation level, thereby contributing to the ability of the battalion to function effectively in combat."

Captain Sacks went overseas in August, 1944 with the medical detachment of the 512th Field Artillery and served four months in France. Prior to entering the service as a first lieutenant in January, 1944 he was serving as an intern in a New York hospital.

The Bronze Star Medal was recently awarded to Capt. Emanuel Sprei, Class of 1938, accompanied by the citation "for meritorious service in connection with military operations against an enemy of the United States in France during the period July 29 to October 31, 1944. He has repeatedly established his aid station immediately behind the front lines, thereby expediting the treatment and evacuation of the wounded. His professional knowledge and untiring efforts have enabled his medical detachment to function with precision and dispatch."

Capt. Morton M. Spielman, Class of 1937, has been awarded the Bronze Star Medal for "heroic achievement in connection with military operations in — France on November 12, 1944. Shortly before dark a group of vehicles, while crossing a treadway bridge, received a concentration of

enemy artillery fire. Five men in the advance vehicle were seriously wounded and in urgent need of medical aid. When Captain Spielman reached the bridge he found that the artillery fire was still falling in the area and that the vehicles had continued onward in order to get out of the area. Due to the intense fire he was forced to leave his vehicle and proceed on foot. Accompanied by his driver he walked through one burning town and proceeded to the next, where he quickly set up his emergency aid station and rendered medical aid to the unit. Two of the men required immediate surgical attention and blood plasma. He performed the necessary surgical treatment under the most adverse conditions and as a result of his efforts the men survived."

Entered the military service from Maryland.

Capt. Louis W. Leskin, Class of 1937, was awarded the Asiatic-Pacific campaign ribbon with two battle stars and the Distinguished Unit citation while serving as a medical officer in the Southwest Pacific theater of operations. Captain Leskin has returned after thirty-five months of service and is awaiting his next assignment. Before entering the service in January, 1942 he was a physician with the Veterans' Administration of Baltimore.

#### PROMOTIONS

*To rank of Lieut. Colonel:*

Walter H. Gerwig, Class of 1935.

*To rank of Captain:*

Louis C. Garies, Class of 1938.

Joseph G. Varhol, Class of 1943.

#### NEWS ITEMS

Lieut. Jesse N. Borden, Class of 1940, is serving with the 119th General Hospital in England. He entered the Army in February, 1944 and served at Woodrow Wilson General Hospital before joining the unit for overseas duty. Lieutenant Borden is in charge of the orthopedic section of this hospital.

Capt. George Silverton, Class of 1932, is chief of x-ray service with the 2nd Evacuation Hospital. This unit, an affiliate of St. Luke's Hospital of New York City, has been overseas since September, 1942 and was functioning in the United Kingdom prior to D-day. Since that time the unit has been actively engaged on the Western Front, both in Normandy and Belgium.

Lieut. Alvin S. Hartz, Class of 1939, was among the doctors of the 41st Field Hospital who treated wounded Americans and Filipinos recently liberated from the Japanese at Los Banos.

Major Mortimer D. Abrashkin, Class of 1932, is serving with the 17th Field Hospital, A.P.O. 265, c/o Postmaster, San Francisco, Calif.

Major Charles L. Goodhand, Class of 1934, is chief of the surgical service of the 55th Station Hospital. This hospital is one of the many units of the Peninsular Base Headquarters in Italy and has served overseas for almost two years. Commissioned as captain in August, 1942, Major Goodhand was promoted to his present rank in April, 1943.

Capt. Cecil M. Hall, Class of 1925, is serving in the 187th General Hospital in England. He entered the service in December, 1942 and has been overseas since April, 1944.

#### 142ND GENERAL HOSPITAL

Sometime during the fall of 1944 General Hospital Unit No. 142, under the command of Col. M. M. Copeland, moved from the Fiji Islands to the China-Burma-India Theatre, A.P.O. 465, c/o Postmaster, New York.

This unit arrived in the South Pacific in the summer of 1942 and spent the following two years in the Fijis. The hospital, now largely expanded both as to capacity and personnel, is comfortably housed in rows of sprawling concrete buildings in or near a large city in India. Each ward is an independent unit with offices for medical officers and nurses, a small diet kitchen, a utilities room, baths, showers, and latrines.

In a recent letter Col. Harry C. Hull, chief of the surgical service, writes: "We are all more than comfortably busy. Each doctor has his own ward or two or three and runs his own show. Robbie has four wards, with one doctor as an assistant. Mays has but one, but with O.P.D. four afternoons a week and all of the cystoscopies has plenty to do. He has had some interesting surgery. John Atkins is busy as a medical consultant. Coughlan runs the officers' surgical section and in addition has charge of the dispensary in surgery and proctology. Kilby's department fairly whirls and Dickey is very busy running a good part of the administration on the medical service. King Seegar is getting some gynecology and Bill Helfrich has charge of several busy wards. Gillis turns out a prodigious number of patients a month, mostly outpatients. Newell always has plenty to do. Browning and Cronin, with five other officers, take care of dentistry; they have wonderful facilities."



The laboratory has been enlarged and Lieut. Col. James Greiner, chief of that service, writes that he is getting some interesting material in the way of surgical pathology which helps to relieve the monotony of the usual routines.

Rotation is a prominent topic for discussion. Some of the nurses have left the unit and several of the medical officers are alerted for return.



142ND GENERAL HOSPITAL UNIT IN ITS NEW LOCATION IN INDIA

To The Members of The Armed Forces,  
From the School of Medicine,  
University of Maryland:

In order that a suitable and permanent memorial may be established for those of the School of Medicine, University of Maryland, who have served with The Armed Forces of the United States during this war, Dean Patterson has appointed the following Committee to collect the necessary data:

Dr. Hugh R. Spencer, Chairman  
Dr. W. Houston Toulson  
Dr. John A. Wagner  
Mrs. Bessie Maston Arnurius

This committee is instructed to make a complete list of those who have joined the Armed Forces since September 1, 1939 and who were on active duty with the School of Medicine at the time of their activation.

The list is to include those in the following categories:

1. Members of the faculty of the School of Medicine.
2. Members of the visiting staff of the University or Mercy Hospitals not included in No. 1.
3. Members of the faculty of the Nurses' Training Schools and of the nursing staff of the University or Mercy Hospitals.
4. Residents and interns of the University and Mercy Hospitals.
5. Professional personnel of General Hospitals No. 42 and 142 as originally constituted and not included in above categories.

\* \* \*

NAME:

SERVICE NUMBER:

BRANCH OF SERVICE:

DATE OF ACTIVATION:

ORGANIZATIONS TO WHICH ASSIGNED:

INITIAL RANK:

PROMOTIONS WITH DATES:

AREAS OF SERVICE (U. S. OR OVERSEA):

CURRENT ADDRESS:

COMMENDATIONS: AND/OR DECORATIONS:

DATE OF TERMINATION OF SERVICE:

DATE OF BIRTH:

HOME ADDRESS:

NAME AND ADDRESS OF NEXT OF KIN:

SCHOOL OF GRADUATION (MEDICAL OR NURSING): YEAR OF GRADUATION:

RANK OR POSITION HELD IN MEDICAL SCHOOL

OR IN UNIVERSITY OR MERCY HOSPITAL:

REVERSE SIDE FOR REMARKS:

PLEASE FILL OUT AND RETURN TO:

DR. JOHN A. WAGNER, SCHOOL OF MEDICINE,  
UNIVERSITY OF MARYLAND, BALTIMORE 1, MD.

#### MEDICAL LIBRARY NOTES

Mrs. Ida M. Robinson has been appointed librarian of the Medical-Dental-Pharmacy Libraries.

Mrs. Robinson holds the degree of B.A. from Cornell University (1924), and B.S.L.S. from Columbia University (1944). She was assistant librarian of the New York State College of Agriculture from 1929 to 1934, and librarian of the Payne Whitney Psychiatric Clinic, New York City, from 1937 until her present assignment.

## OBITUARIES

### COL. WILLIAM NEWBOLD BISPHAM

Col. William Newbold Bispham, M.C., U.S.A. (retired), died in the University Hospital on January 1, 1945 in his seventieth year.

A graduate of the School of Medicine, University of Maryland, Class of 1897, Colonel Bispham entered the Medical Corps in October, 1900 as a first lieutenant. He served at various Army stations in the United States and in foreign possessions, including tours of duty in the Philippines, Cuba, and Panama. He was a veteran of World War I. Colonel Bispham had been a lecturer in medicine at the University of Maryland since 1939 and was especially qualified in the field of malariology. Among some of the more important assignments he filled while on active duty were those of Director of the Medical Field Service School, Fort Leavenworth, Kansas, Surgeon of the Bureau of Militia Affairs of the War Department, Surgeon of the Fourth Corps Area and of the Third Corps Area. He left the active list while serving in the latter position on reaching the statutory age of retirement in 1939.

Colonel Bispham was a member of the American Medical Association, the Medical and Chirurgical Faculty of Maryland, the Baltimore City Medical Society, the American Association of Tropical Medicine, and the Malaria Society of the United States, and a fellow of the American College of Surgeons.

### M. RANDOLPH KAHN, M.D.

Dr. M. Randolph Kahn, Clinical Professor of Ophthalmology, died on January 11, 1945. Until his retirement because of ill health Dr. Kahn also was on the medical advisory board of Mercy Hospital and a member of the Maryland Medical Induction Board.

Born in Baltimore in 1887, Dr. Kahn was graduated from the School of Medicine, University of Maryland in 1912. He was appointed instructor in the ophthalmology clinic at the Johns Hopkins Hospital in 1920. The following year he was named associate professor of ophthalmology at the University of Maryland and was appointed clinical professor here in 1924. He had formerly served in a similar capacity with the United States Veterans' Bureau.

Dr. Kahn was a member of the Baltimore City Medical Society and a lieutenant in the Army Medical Reserve Corps in World War I.

## OBITUARIES

- Ashbury, Howard Elmer**, Baltimore, Md.; class of 1903; aged 64; died, February 20, 1945, of heart disease following a short illness.
- Bowen, Josiah Slicer, Jr.**, Baltimore, Md.; class of 1903; died, October 20, 1944, of coronary disease.
- Bowen, Ralph Childs**, Cumberland, Md.; class of 1907; aged 60; died, February 28, 1945.
- Browning, B. Ray**, Littleton, N. C.; class of 1891; aged 77; died, November 26, 1944, of cardiorenal vascular disease.
- Bushong, Daniel B.**, Charles Town, W. Va.; B.M.C., class of 1893; aged 74; died, October 30, 1944, of acute coronary thrombosis with arteriosclerosis.
- Caughman, Belton Drafts**, Columbia, S. C.; class of 1911; served during World War I; aged 59; died, November 30, 1944, of coronary thrombosis.
- Copeland, Robert M.**, Vevay, Ind.; P. & S., class of 1888; aged 83; died, October 28, 1944, after a brief illness.
- Corbin, Emmett Addis**, Eaton, Colo.; P. & S., class of 1907; aged 61; died, October 5, 1944, of pulmonary embolism following an operation for carcinoma.
- Creaven, Matthew F.**, Pittsburgh, Pa.; P. & S., class of 1891; aged 80; died, October 21, 1944, of chronic nephritis and arteriosclerosis.
- Feindel, Joseph Creighton**, Athol, Mass.; P. & S., class of 1897; aged 79; died, December 20, 1944, of coronary thrombosis.
- Fine, M. James**, Newark, N. J.; class of 1910; aged 60; died, December 17, 1944, of heart disease.
- Killelea, Edward Vincent**, Fitchburg, Mass.; B.M.C., class of 1903; aged 63; died, October 28, 1944, of pulmonary tuberculosis.
- Luippold, Eugene J.**, Weehawken, N. J.; B.M.C., class of 1907; aged 58; died, December 16, 1944, of melanocarcinoma.
- McCampbell, John**, Morgantown, N. C.; B.M.C., class of 1894; aged 76; died, November 5, 1944, of carcinoma of the head of the pancreas.
- McNitt, Gilbert F.**, Racine, Wis.; P. & S., class of 1879; aged 90; died, October 23, 1944, of cerebral thrombosis.
- Pepper, John Kerr**, Winston-Salem, N. C.; P. & S., class of 1907; aged 67; died, October 31, 1944, of heart disease and pneumonia.
- Plummer, Frank E.**, Dayton, O.; B.M.C., class of 1895; aged 76; died, November 15, 1944, of cerebral hemorrhage.
- Rosenthal, Charles Morton**, Brooklyn, N. Y.; class of 1934; aged 35; died, September 1, 1944, of subacute bacterial endocarditis.
- Sheridan, Charles Reynolds**, Detroit, Mich.; class of 1907; aged 58; died, October 3, 1944, of heart disease.



**Talbot, Francis J.**, Niagara Falls, N. Y.; B.M.C., class of 1911; aged 58; died, November 11, 1944, of cerebral hemorrhage.

**Warren, Lloyd Cyrus**, Franklin, N. Y.; B.M.C., class of 1911; served during World War I; aged 61; died, September 14, 1944, of coronary occlusion.

**Wilson, Samuel Clyde**, Oxford, Pa.; B.M.C., class of 1908; aged 63; died, November 1, 1944, of cardiac thrombosis.

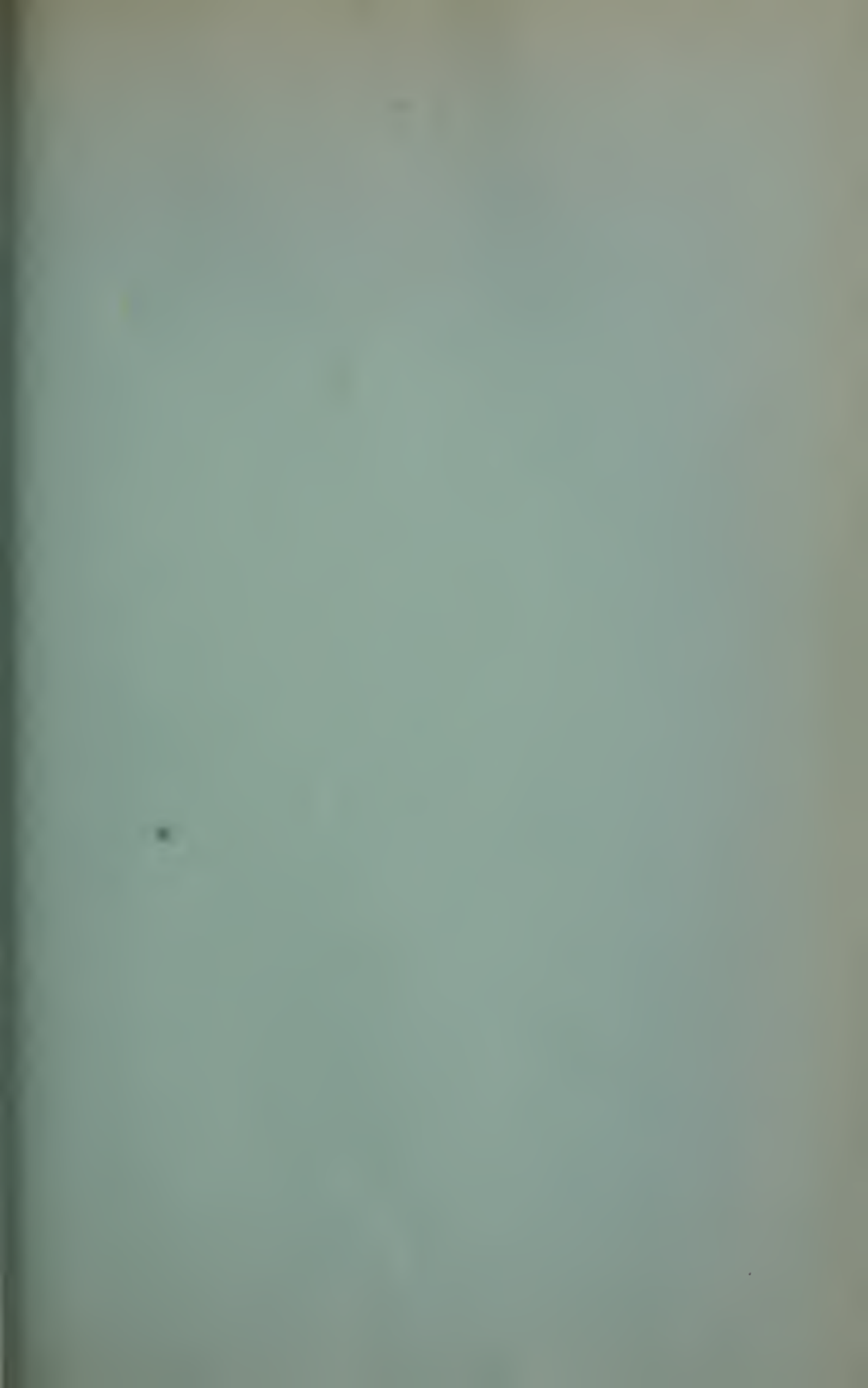


## INDEX TO VOLUME 29

Alumni Association Section.....	48, 100, 162, 228
Anesthesia—Man's redemption from pain, John C. Krantz, Jr.....	79
Aneurysm, Dissecting, William H. Leitch.....	7
Bispham, William Newbold—Obituary.....	235
Bird, Lieut. Joseph G., M.C., A.U.S.....	109
Brantigan, Otto C.....	175
Bulluck, Ernest Southerland—Obituary.....	57
Cancer problem, Some practical phases of, Hugh R. Spencer.....	195
Commencement address, Norman T. Kirk.....	154
Davis, Lieut. George H., M.C., A.U.S.....	1
Davis, J. Wilfrid.....	125
Department of Obstetrics, School of Medicine, University of Maryland, 1942 and 1943 Annual Report.....	31
Department of Obstetrics, School of Medicine, University of Maryland, Case Histories.....	92, 149, 210
Diaphragm, rupture of varicosities of, Hemothorax and hemoperitoneum following, M. Virginia Palmer and William H. Leitch.....	201
Dicumarol, Clinical use of, Wilfred H. Townshend, Jr. and Alvin H. Honigman.....	61
Ductus arteriosus, patent, Ligation of, Alvin H. Honigman and Otto C. Brantigan.....	175
Duvall, Wirt Adams—Obituary.....	106
Epidemiologic highlights—Baltimore, 1944, J. Wilfrid Davis.....	125
Fissel, John E.—Obituary.....	106
Fowl mite dermatitis ( <i>Dermanyssus gallinae</i> ), E. Paul Knotts.....	207
Hebb, Arthur—Obituary.....	57
Hebb, Donald B.....	88
Hemothorax and hemoperitoneum following rupture of varicosities of the diaphragm, M. Virginia Palmer and William H. Leitch.....	201
Honigman, Alvin H.....	61, 175
Housing as a public health responsibility, Wilmer H. Schulze.....	130
Hyperthyroidism and thiouracil, M. Virginia Palmer.....	141
Hyperthyroidism in pregnancy, George H. Davis.....	1
Kahn, M. Randolph—Obituary.....	235
Kirk, Major Gen. Norman T., M.C., U.S.A.....	154
Knotts, E. Paul.....	207
Krantz, John C., Jr.....	79
Laserte, Charles J.—Obituary.....	106
Leitch, Lieut. William H., M.C., A.U.S.....	7, 201
Longsdorf, H. H.—Obituary.....	57

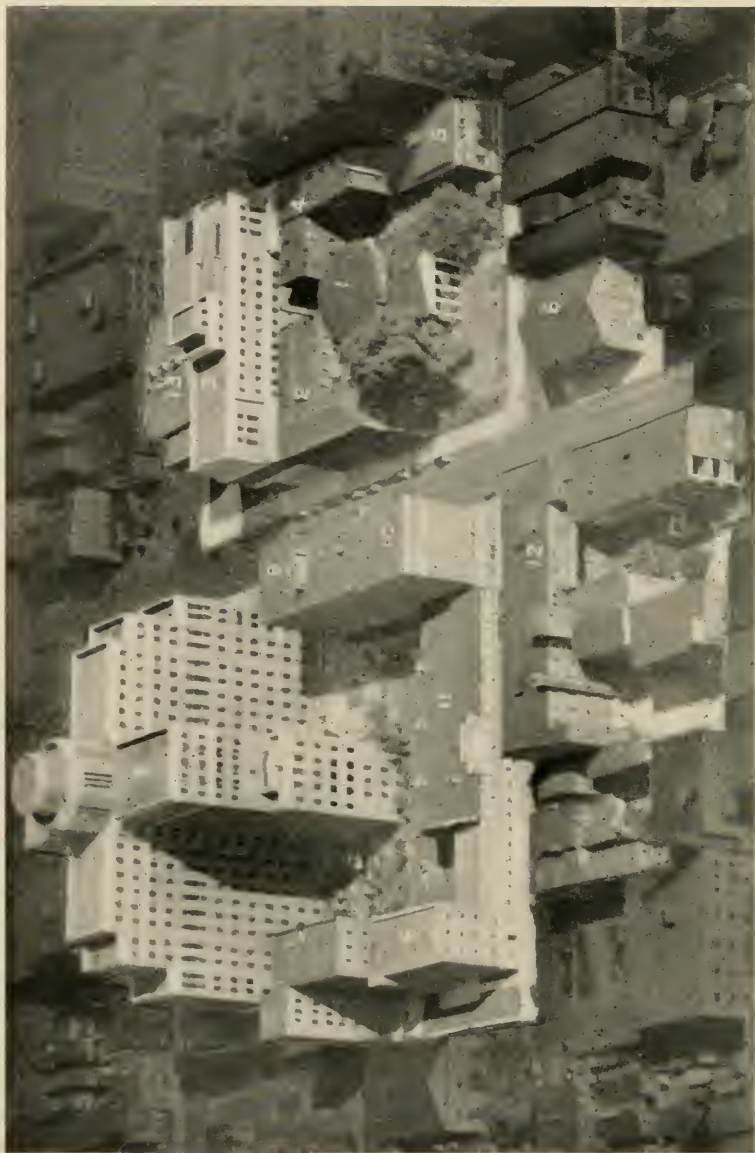
Markline, Simeon V. T.—Obituary . . . . .	173
Martin, P. F.—Obituary . . . . .	107
Monthly Meetings of the University Hospital Staff:	
Cavernous sinus thrombosis as a complication of adenotonsillectomy, Samuel L. Fox and G. Brooks West, Jr. . . . .	151
Treatment of a problem child, A. J. Rockwell . . . . .	153
A case of psychogenic asthma, Hans W. Loewald . . . . .	153
Ambulatory insulin therapy with electroshocks in mental disorders, Benjamin Pushkin . . . . .	212
Iatrogeny in syphilis, Leon Freedom . . . . .	212
Medical experiences in the Southwest Pacific, Col. George H. Yeager, M.C., A.U.S. . . . .	213
February Meeting, Grant E. Ward, E. R. Shipley and Riley S. Williamson . . . . .	223
Novey, M. Alexander . . . . .	135
Obituaries . . . . .	57, 106, 173, 235
Obstetric case history . . . . .	92, 149, 210
Palmer, M. Virginia . . . . .	141, 201
Pierpont, Ross Z. . . . .	88
Pregnancy, Hyperthyroidism in, George H. Davis . . . . .	1
Proceedings of the University of Maryland Biological Society:	
One Hundred and Thirty-Third Program Meeting . . . . .	44
One Hundred and Thirty-Fourth Program Meeting . . . . .	46
One Hundred and Thirty-Fifth Program Meeting . . . . .	47
One Hundred and Thirty-Sixth Program Meeting . . . . .	159
One Hundred and Thirty-Seventh Program Meeting . . . . .	159
One Hundred and Thirty-Eighth Program Meeting . . . . .	159
One Hundred and Thirty-Ninth Program Meeting . . . . .	224
One Hundred and Fortieth Program Meeting . . . . .	226
One Hundred and Forty-First Program Meeting . . . . .	227
Prostatectomies, perineal and suprapubic, Comparative study of, at the Baltimore City Hospitals, Ross Z. Pierpont and Donald B. Hebb . . . . .	88
Publications by the Staff of the School of Medicine, University of Maryland, 1943 . . . . .	93
Rickettsial diseases, Joseph G. Bird . . . . .	109
Sabatino, Bernard Joseph—Obituary . . . . .	106
Schulze, Wilmer H. . . . .	130
Spencer, Hugh R. . . . .	195
Sproull, O. T.—Obituary . . . . .	59
Thiouracil and hyperthyroidism, M. Virginia Palmer . . . . .	141
Townshend, Wilfred H., Jr. . . . .	61
Venereal disease problem, Baltimore's, Newer points of attack on, M. Alexander Novey . . . . .	135
Walker, H. D.—Obituary . . . . .	107
Wootton, William Turner—Obituary . . . . .	59











# BALTIMORE SCHOOLS—UNIVERSITY OF MARYLAND

1. Original Medical Building
2. Laboratory Building, Medicine
3. Bressler Building, Medicine
4. Gray Laboratory, Students' Lounge, Medicine
5. Administration Building, College of Education,  
Baltimore Division
6. Medical Library
7. University Hospital
8. Nurses' Home, Medicine
9. School of Pharmacy
10. School of Dentistry
11. Dental Clinic
12. Out-Patient Clinics, Medicine
13. School of Law



BULLETIN  
OF THE  
SCHOOL *of* MEDICINE  
UNIVERSITY OF MARYLAND



*Announcements*

*The One Hundred Thirty-eighth Academic Session*  
*January 13, 1944–September 29, 1944*

*and*

*The One Hundred Thirty-ninth Academic Session*  
*October 19, 1944–June 22, 1945*

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*Catalogue for Session April 8–December 23, 1943*

SEPTEMBER, 1944



# CONTENTS

	PAGE		PAGE
Calendar.....	4	Genito-Urinary Surgery.....	76
Calendars for 1944, 1945.....	5,6	Gross Anatomy.....	58
Partial Calendar.....	7	Gynecology.....	81
Organization.....	8	Histology and Embryology.....	59
Board of Regents.....	8	History of Medicine.....	83
University Senate.....	9	Hygiene and Public Health.....	70
Faculty of Medicine.....	9	Industrial Medicine and Surgery....	79
Fellows.....	19	Legal Medicine.....	70
University Hospital.....	20	Medicine.....	62
Executive Committee.....	20	Neuro-Anatomy.....	59
Hospital Staff.....	20	Neurological Surgery.....	78
Resident and Intern Staff.....	22-23	Neurology.....	69
Dispensary Staff.....	24	Obstetrics.....	80
Dispensary Report.....	29	Oncology.....	78
Mercy Hospital.....	30	Ophthalmology.....	82
Hospital Staff.....	30	Oral Surgery.....	79
Resident and Intern Staff.....	34	Orthopaedic Surgery.....	75
Dispensary Staff.....	35	Otology.....	77
Dispensary Report.....	37	Pathology.....	61
Baltimore City Hospitals—Staff.....	38	Pediatrics.....	68
Kernan Hospital—Staff.....	40	Pharmacology.....	61
The School of Medicine.....	41	Physiology.....	60
History.....	41	Plastic Surgery.....	80
Buildings and Facilities.....	41	Psychiatry.....	67
Wartime Requirements for Admission..	46	Rectum and Colon.....	77
Standard Requirements for Admission..	48	Rhinology and Laryngology.....	75
Application.....	48	Roentgenology.....	83
Minimum Requirements.....	48	Surgery.....	71
Combined Course in Arts and Sci- ences, and Medicine.....	49	Schedules of Courses.....	84
State Medical Student Qualifying Cer- tificates.....	50	Graduates, December 23, 1943.....	89
Definition of Residence Status.....	50	Internships, Graduates of December 23, 1943.....	90
Current Fees.....	50	Matriculates, April 8 to December 23, 1943.....	93
Rules for Payment of Fees.....	51	Geographical Distribution of Students, April 8 to December 23, 1943.....	99
Penalty for Non-Payment of Fees.....	51	College Sources of Students, April 8 to December 23, 1943.....	100
Reexamination Fee.....	51	Internships, Graduates of September 29, 1944.....	101
Maintenance and Service Fee.....	51	Matriculates, January 13 to September 29, 1944.....	103
Personal Expenses.....	52	Geographical Distribution of Students, January 13 to September 29, 1944.....	109
Student Health Service.....	52	College Sources of Students, January 13 to September 29, 1944.....	110
General Rules.....	53	Medical Alumni Association.....	111
Prizes.....	54	Endowment Fund.....	111
Scholarships.....	54	University of Maryland School of Nursing.....	112
Loan Funds.....	57	Mercy Hospital School of Nursing....	112
Organization of the Curriculum.....	58	Index of Names.....	115
Anaesthesia.....	74		
Art as Applied to Medicine.....	83		
Bacteriology and Immunology.....	60		
Biological Chemistry.....	61		
Clinical Pathology.....	66		
Dermatology.....	74		
First Aid.....	79		
Gastro-Enterology.....	67		

# CALENDAR

1944							1945														1946							
JULY							JANUARY							JULY							JANUARY							
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## CALENDAR—ACCELERATED PROGRAM

ACADEMIC YEAR—JANUARY 13 TO SEPTEMBER 29, 1944

1944

January 4, 5, 6

Re-examinations

### FIRST SEMESTER

January 11	Tuesday	*Registration, Freshmen and Sophomores
January 12	Wednesday	*Registration, all other students
January 13	Thursday	Instruction begins
February 22	Tuesday	Washington's Birthday—Holiday
April 6	Thursday	Instruction suspended 6:00 P.M.
April 7 and 8		Easter recess
April 10	Monday	Instruction resumed
May 1	Monday	Examinations, all classes,
to		*Registration for second semester
May 6	Saturday	First semester completed at 2:00 P.M.

### SECOND SEMESTER

May 15	Monday	Instruction resumed
May 30	Tuesday	Memorial Day—Holiday
July 4	Tuesday	Independence Day—Holiday
August 5	Saturday	Instruction suspended 2:00 P.M.
August 7 to August 26		Summer vacation
August 28	Monday	Instruction resumed
September 4	Monday	Labor Day—Holiday
September 9	Saturday	Senior and Junior instruction ends 2:00 P.M.
September 11	Monday	Senior and Junior examinations begin
September 16	Saturday	Senior examinations completed
		Sophomore and Freshman instruction ends 12 noon
September 18	Monday	Junior examinations continue
		Sophomore and Freshman examinations begin
September 23	Saturday	Announcement of graduates
		All examinations completed
		Second semester completed 12:30 P.M.
September 29	Friday	Graduation, at Baltimore

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\* A student who fails to register prior to or within the day or days specified will be called upon to pay a late registration fee of five dollars (\$5.00). The last day of registration with fee added to regular charges is Saturday of the week in which registration begins.

The offices of the registrar and comptroller are open daily, not including Saturday, from 9:00 a.m. to 5:00 p.m., and Saturday from 9:00 a.m. to 12:30 p.m.

Early registration is encouraged.

# CALENDAR—ACCELERATED PROGRAM

ACADEMIC YEAR—OCTOBER 19, 1944 TO JUNE 22, 1945

1944

October 10, 11, 12

Re-examinations

## FIRST SEMESTER

October 17	Tuesday	*Registration, Freshmen and Sophomores
October 18	Wednesday	*Registration, all other students
October 19	Thursday	Instruction begins, 8:30 A.M.
November 22	Wednesday	Instruction suspended, 5:00 P.M.
November 23	Thursday	Thanksgiving Day—Holiday
November 24	Friday	Instruction resumed, 8:30 A.M.
December 23	Saturday	Instruction suspended, 2:00 P.M. Christmas recess

1945

January 3	Wednesday	Instruction resumed, 8:30 A.M.
February 12	Monday	Examinations, all classes
to		*Registration for second semester
February 17	Saturday	First semester completed, 2:00 P.M.

## SECOND SEMESTER

February 19	Monday	Instruction resumed, 8:30 A.M.
February 21	Wednesday	Instruction suspended, 5:00 P.M.
February 22	Thursday	Washington's Birthday—Holiday
February 23	Friday	Instruction resumed, 8:30 A.M.
March 29	Thursday	Instruction suspended, 5:30 P.M. Easter recess
April 2	Monday	Instruction resumed, 8:30 A.M.
May 29	Tuesday	Instruction suspended, 5:30 P.M.
May 30	Wednesday	Memorial Day—Holiday
May 31	Thursday	Instruction resumed, 8:30 A.M.
June 2	Saturday	Senior and Junior instruction ends at 2:00 P.M.
June 4	Monday	Senior and Junior examinations begin
June 9	Saturday	Senior examinations completed at 12 noon Sophomore and Freshman instruction ends at 12 noon
June 11	Monday	Junior examinations continue Sophomore and Freshman examinations begin
June 16	Saturday	Announcement of graduates All examinations completed Second semester completed at 1:00 P.M.
June 22	Friday	Graduation, at Baltimore

June 25 to July 14, inclusive. Vacation Period

\* A student who fails to register prior to or within the day or days specified will be called upon to pay a late registration fee of five dollars (\$5.00). The last day of registration with fee added to regular charges is Saturday of the week in which registration begins.

The offices of the registrar and comptroller are open daily, not including Saturday, from 9:00 a.m. to 5:00 p.m., and Saturday from 9:00 a.m. to 12:30 p.m.

## PARTIAL CALENDAR—ACCELERATED PROGRAM

ACADEMIC YEAR—JULY 19, 1945 TO MARCH 22, 1946

1945

July 12 and 13

Re-examinations

### FIRST SEMESTER

July 17	Tuesday	*Registration, Sophomores; (Freshmen: see note below).
July 18	Wednesday	*Registration, all other students
July 19	Thursday	Instruction begins, 8:30 A.M.
September 1	Saturday	Instruction suspended, 2:00 P.M.
September 3	Monday	Labor Day—Holiday
September 4	Tuesday	Instruction resumed, 8:30 A.M.
November 5	Monday	Examinations, all classes
to		*Registration for second semester
November 10	Saturday	First semester completed, 2:00 P.M.

*Note to Freshmen*—It is planned to re-establish the standard four-year Medical School program for the freshman class which is to be admitted to this School in 1945, provided the War and Navy Departments agree. Members of this class, including A.S.T.P. and V-12 Personnel, are referred to the partial standard calendar, which follows:

## PARTIAL CALENDAR—STANDARD PROGRAM

ACADEMIC YEAR—SEPTEMBER 26, 1945 TO JUNE 1, 1946

### FIRST SEMESTER

1945

September 25	Tuesday	*Registration, Freshmen only
September 26	Wednesday	Instruction begins, 9:00 A.M.
November 28	Wednesday	Instruction suspended, 5:00 P.M.
November 29	Thursday	Thanksgiving Day—Holiday
November 30	Friday	Instruction resumed, 9:00 A.M.
December 21	Friday	Instruction suspended, 5:00 P.M. Christmas Recess

1946

January 3	Thursday	Instruction resumed, 9:00 A.M.
January 28	Monday	Examinations, Freshmen only
to		*Registration for second semester, Freshmen only
February 2	Saturday	First semester completed, 2:00 P.M.

\*A student who fails to register prior to or within the day or days specified will be called upon to pay a late registration fee of five dollars (\$5.00). The last day of registration with fee added to regular charges is Saturday of the week in which registration begins.

The offices of the registrar and comptroller are open daily, not including Saturday, from 9:00 a.m. to 5:00 p.m., and Saturday from 9:00 a.m. to 12:30 p.m.

# ORGANIZATION

## THE UNIVERSITY OF MARYLAND

HARRY CLIFTON BYRD, B.S., LL.D., D.Sc., *President and Executive Officer*

### BOARD OF REGENTS

	<i>Term Expires</i>
§ ROWLAND K. ADAMS, <i>Chairman</i> .....	1948
WILLIAM P. COLE, JR., <i>Vice-Chairman</i> .....	1949
MRS. JOHN L. WHITEHURST, <i>Secretary</i> .....	1947
J. MILTON PATTERSON, <i>Treasurer</i> .....	1944
T. ROY BROOKES.....	1952
W. CALVIN CHESNUT.....	1951
E. PAUL KNOTTS.....	1945
HARRY H. NUTTLE.....	1950
STANFORD Z. ROTHSCHILD.....	1952
JOHN E. SEMMES.....	1951
PHILIP C. TURNER.....	1950

§ Died July 29, 1944.

The control of the University of Maryland is assigned to a Board of Regents appointed by the Governor and confirmed by the Senate for terms of nine years each. The general administration of the University is vested in the President. The University Council is an advisory body, composed of the President, the Director of the Agricultural Experiment Station, the Director of the Extension Service, and the Deans. The University Council acts upon all matters having relation to the University as a whole, or to co-operative work between the constituent groups. Each school has its own Faculty Council, composed of the Dean and members of its faculty; each Faculty Council controls the internal affairs of the group it represents.

The University has the following educational organizations:

At Baltimore  
 The School of Dentistry  
 The School of Law  
 The School of Medicine  
 The School of Nursing  
 The School of Pharmacy

At College Park  
 The College of Agriculture  
 The College of Arts and Sciences

The College of Commerce  
 The College of Education  
 The College of Engineering  
 The College of Home Economics  
 The Graduate School  
 The Department of Military  
     Science and Tactics  
 The Department of Physical  
     Education and Recreation  
 The Summer School



## THE UNIVERSITY SENATE (Baltimore Schools)

H. C. BYRD, B.S., LL.D., D.Sc.....	President of the University
ROB'T. U. PATTERSON, M.D., C.M., LL.D.....	Dean of School of Medicine and Superintendent of the Hospital
H. BOYD WYLIE, M.D.....	Assistant Dean of School of Medicine
ROGER HOWELL, Ph.D., LL.B.....	Dean of the School of Law
ANDREW G. DUMEZ, M.S., Ph.D.....	Dean of the School of Pharmacy
J. BEN ROBINSON, D.D.S., F.A.C.D.....	Dean of the School of Dentistry
J. FREEMAN PYLE, Ph.D.....	Acting Dean of the College of Arts and Sciences
ALMA H. PREINKERT, M.A.....	Registrar
EDGAR F. LONG, Ph.D.....	Acting Director of Admissions

## FACULTY OF MEDICINE

### EMERITI

J. FRANK CROUCH, M.D....	Professor of Clinical Ophthalmology and Otology, Emeritus
HARRY FRIEDENWALD, A.B., M.D., D.H.L., D.Sc..	Professor of Ophthalmology, Emeritus
WILLIAM S. GARDNER, M.D. ....	Professor of Gynecology, Emeritus
J. M. H. ROWLAND, M.D., D.Sc., LL.D.	Professor of Obstetrics, Emeritus; Dean, Emeritus
J. DAWSON REEDER, M.D....	Professor of Diseases of the Rectum and Colon, Emeritus

## FACULTY BOARD

ROB'T. U. PATTERSON, *Dean*

H. BOYD WYLIE, *Assistant Dean*

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THOMAS B. AYCOCK	O. G. HARNE	MILTON S. SACKS
CHARLES BAGLEY, JR.	J. MASON HUNDLEY, JR.	EMIL G. SCHMIDT
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HOWARD M. BUBERT	C. LORING JOSLIN	DIETRICH C. SMITH
T. NELSON CAREY	EDWARD A. KITLOWSKI	IRVING J. SPEAR
C. JELLEFF CARR	JOHN C. KRANTZ, JR.	HUGH R. SPENCER
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ALBERTUS COTTON	JAMES G. McALPINE	EDUARD UHLENHUTH
CARL L. DAVIS	ZACHARIAH MORGAN	ALLEN FISKE VOSHELL
E. HOLLISTER DAVIS	THOMAS R. O'ROURK	HENRY J. WALTON
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PAGE EDMUNDS	H. R. PETERS	WALTER D. WISE
CHARLES REID EDWARDS	J. G. M. REESE	THOMAS C. WOLFF
FRANK H. J. FIGGE	CHARLES A. REIFSCHNEIDER	ROBERT B. WRIGHT

## EXECUTIVE COMMITTEE OF THE FACULTY

ROB'T. U. PATTERSON, *Dean*

H. BOYD WYLIE, *Assistant Dean*

LOUIS H. DOUGLASS	J. MASON HUNDLEY, JR.
CHARLES REID EDWARDS	ARTHUR M. SHIPLEY
FRANK W. HACHTEL	HUGH R. SPENCER

THOMAS P. SPRUNT

## FACULTY OF MEDICINE

## PROFESSORS

- William R. Amberson, Ph.D., Professor of Physiology.  
 Thomas B. Aycock, B.S., M.D., Professor of Clinical Surgery.  
 Charles Bagley, Jr., M.A., M.D., Professor of Neurological Surgery.  
 Harvey G. Beck, M.D., D.Sc., Professor of Clinical Medicine.  
 Charles F. Blake, M.A., M.D., Professor of Diseases of the Rectum and Colon.  
 \*Otto C. Brantigan, B.S., M.D., Professor of Surgical Anatomy, Associate Professor of Surgery.  
 Ross McC. Chapman, M.D., Professor of Psychiatry.  
 Clyde A. Clapp, M.D., Professor of Ophthalmology.  
 \*Richard G. Coblentz, M.A., M.D., Clinical Professor of Neurological Surgery.  
 Albertus Cotton, M.A., M.D., Professor of Orthopaedic Surgery and Roentgenology.  
 Carl L. Davis, M.D., Professor of Anatomy.  
 \*Brice M. Dorsey, D.D.S., Professor of Oral Surgery.  
 Louis H. Douglass, M.D., Professor of Obstetrics.  
 Page Edmunds, M.D., Professor of Traumatic Surgery.  
 \*Charles Reid Edwards, M.D., Professor of Surgery.  
 \*Monte Edwards, M.D., Clinical Professor of Surgery and of Diseases of the Rectum and Colon.  
 H. K. Fleck, M.D., Clinical Professor of Ophthalmology.  
 Edgar B. Friedenwald, M.D., Professor of Clinical Pediatrics.  
 Thomas K. Galvin, M.D., Clinical Professor of Gynecology.  
 Joseph E. Gichner, M.D., Professor of Clinical Medicine and Physical Therapeutics.  
 Andrew C. Gillis, M.A., M.D., LL.D., Professor of Neurology.  
 Frank W. Hachtel, M.D., Professor of Bacteriology.  
 J. Mason Hundley, Jr., M.A., M.D., Professor of Gynecology.  
 \*Elliott H. Hutchins, M.A., M.D., Professor of Surgery.  
 F. L. Jennings, M.D., Professor of Clinical Surgery.  
 C. Loring Joslin, M.D., Professor of Pediatrics.  
 M. Randolph Kahn, M.D., Clinical Professor of Ophthalmology.  
 \*Walter L. Kilby, M.D., Acting Professor of Roentgenology.  
 John C. Krantz, Jr., Ph.D., Professor of Pharmacology.  
 Kenneth D. Legge, M.D., Clinical Professor of Genito-Urinary Surgery.

It is to be noted that for convenience of reference the names of the members of the Faculty are listed in the forepart of this catalogue in alphabetical order. The names are listed in order of seniority under each preclinical and clinical department of the school on subsequent pages.

On the lists of the Faculty of Medicine and Fellows and the Hospital and Dispensary staffs are given the names and positions assigned during the sessions April 8, 1943 to December 23, 1943 and January 13, 1944 to September 29, 1944, unless otherwise indicated. Interim changes are noted as follows:

\* On leave, military service.

\* Promotions effective during the session January 13, 1944 to September 29, 1944.

† Appointments effective during the session January 13, 1944 to September 29, 1944.

‡ Resignations effective during the sessions April 8, 1943 to December 23, 1943 and January 13, 1944 to September 29, 1944.

§ Deaths—dates of.

- G. Carroll Lockard, M.D., Professor of Clinical Medicine.  
 Edward A. Looper, M.D., D.Oph., Professor of Rhinology and Laryngology.  
 Theodore H. Morrison, M.D., Clinical Professor of Gastro-Enterology.  
 Thomas R. O'Rourke, M.D., Clinical Professor of Otology, Associate in Rhinology and Laryngology, and ‡Assistant in Ophthalmology.  
 \*D. J. Pessagno, A.B., M.D., Clinical Professor of Surgery.  
 H. Raymond Peters, A.B., M.D., Professor of Clinical Medicine.  
 \*Maurice C. Pincoffs, B.S., M.D., Professor of Medicine.  
 †J. Dawson Reeder, M.D., Professor of The Diseases of Rectum and Colon.  
 \*Charles A. Reifschneider, M.D., Clinical Professor of Traumatic Surgery and Oral Surgery.  
 Compton Riely, M.D., Clinical Professor of Orthopaedic Surgery.  
 Harry M. Robinson, Sr., M.D., Professor of Dermatology.  
 Arthur M. Shipley, M.D., ScD., Professor of Surgery.  
 Irving J. Spear, M.D., Professor of Neurology.  
 Hugh R. Spencer, M.D., Professor of Pathology.  
 Thomas P. Sprunt, A.B., M.D., Acting Head of the Department of Medicine and Professor of Clinical Medicine.  
 W. Houston Toulson, M.Sc., M.D., Professor of Genito-Urinary Surgery.  
 Eduard Uhlenhuth, Ph.D., Professor of Anatomy.  
 Allen Fiske Voshell, A.B., M.D., Professor of Orthopaedic Surgery.  
 Henry J. Walton, M.D., Professor of Roentgenology.  
 Huntington Williams, M.D., Dr. P.H., Professor of Hygiene and Public Health.  
 \*Walter D. Wise, M.D., Professor of Surgery.  
 H. Boyd Wylie, M.D., Professor of Biological Chemistry and Assistant Dean.  
 Waitman F. Zinn, M.D., Clinical Professor of Rhinology and Laryngology.

### ASSOCIATE PROFESSORS

- Franklin B. Anderson, M.D., Associate Professor of Rhinology and Laryngology, and Otology.  
 Walter A. Baetjer, A.B., M.D., Associate Professor of Medicine.  
 J. McFarland Bergland, B.S., M.D., Associate Professor of Obstetrics.  
 T. Nelson Carey, M.D., Associate Professor of Medicine and Physician in Charge of Medical Care of Students.  
 C. Jelleff Carr, Ph.D., Associate Professor of Pharmacology.  
 Thomas R. Chambers, A.B., M.D., Associate Professor of Surgery.  
 \*Carl Dame Clarke, M.A., Associate Professor of Art as Applied to Medicine.  
 Paul W. Clough, B.S., M.D., Associate Professor of Medicine.  
 \*William Ellsworth Evans, Jr., Ph.D., Associate Professor of Pharmacology.  
 Frank H. J. Figge, Ph.D., Associate Professor of Gross Anatomy.  
 Leon Freedom, M.D., Associate Professor of Neurology and Instructor in Pathology.  
 Moses Gellman, B.S., M.D., Associate Professor of Orthopaedic Surgery.  
 \*T. Campbell Goodwin, M.S., M.D., Associate Professor of Pediatrics.  
 William E. Hahn, D.D.S., Associate Professor of Oral Surgery.  
 O. G. Harne, Associate Professor of Histology.  
 Cyrus F. Horine, M.D., Associate Professor of Surgery.  
 \*Raymond Hussey, M.A., M.D., Associate Professor of Medicine.  
 Edward S. Johnson, M.D., Associate Professor of Surgery.  
 †Hugh W. Josephs, M.D., Associate Professor of Pediatrics.  
 Charles C. W. Judd, M.D., Associate Professor of Medicine.

Vernon D. Kaufman, D.D.S., Associate Professor of Oral Surgery.

\*Edward A. Kitlowski, M.D., Associate Professor of Plastic Surgery.

\*Louis A. M. Krause, M.D., Associate Professor of Medicine.

R. W. Locher, M.D., Associate Professor of Clinical Surgery.

\*William S. Love, Jr., A.B., M.D., Associate Professor of Medicine and Instructor in Pathology.

Howard J. Maldeis, M.D., Associate Professor of Legal Medicine and Associate in Pathology.

N. Clyde Marvel, A.B., M.D., Associate Professor of Surgery.

Charles W. Maxson, M.D., Associate Professor of Surgery.

Sydney R. Miller, B.S., M.D., Associate Professor of Medicine.

James G. McAlpine, Ph.D., Associate Professor of Bacteriology.

Emil Novak, A.B., M.D., D.Sc., Associate Professor of Obstetrics.

Robert H. Oster, Ph.D., Associate Professor of Physiology.

\*C. W. Peake, M.D., Associate Professor of Surgery.

Harry L. Rogers, M.D., Associate Professor of Orthopaedic Surgery.

Emil G. Schmidt, Ph.D., LL.B., Associate Professor of Biological Chemistry.

Dietrich Conrad Smith, Ph.D., Associate Professor of Physiology.

William H. Smith, M.D., Associate Professor of Clinical Medicine.

Ralph P. Truitt, M.D., Associate Professor of Psychiatry.

\*Henry F. Ullrich, M.D., D.Sc., Associate Professor of Orthopaedic Surgery.

Grant E. Ward, A.B., M.D., Associate Professor of Surgery and Oral Surgery.

C. Gardner Warner, A.B., M.D., Associate Professor of Pathology.

Robert B. Wright, B.S., M.D., Associate Professor of Pathology.

Lawrence F. Woolley, M.D., Associate Professor of Psychiatry.

\*\*George H. Yeager, B.S., M.D., Associate Professor of Surgery.

## ASSISTANT PROFESSORS

Rubert S. Anderson, Ph.D., Assistant Professor of Physiology.

H. F. Bongardt, M.D., Assistant Professor of Surgery.

J. Edmund Bradley, B.S., M.D., Assistant Professor of Pediatrics.

Leo Brady, A.B., M.D., Assistant Professor of Gynecology.

H. M. Bubert, M.D., Assistant Professor of Medicine.

\*Charles N. Davidson, M.D., Assistant Professor in Roentgenology.

Ross Davies, M.D., M.P.H., Assistant Professor of Hygiene and Public Health.

J. S. Eastland, A.B., M.D., Assistant Professor of Medicine.

Francis A. Ellis, A.B., M.D., Assistant Professor of Dermatology.

F. Gaynor Evans, Ph.D., Assistant Professor of Gross Anatomy.

Maurice Feldman, M.D., Assistant Professor of Gastro-Enterology.

A. H. Finkelstein, M.D., Assistant Professor of Pediatrics.

\*Harry Goldsmith, M.D., Assistant Professor of Psychiatry.

Henry F. Graff, A.B., M.D., Assistant Professor of Ophthalmology.

\*D. James Greiner, B.S., M.D., Assistant Professor of Pathology.

\*Lewis P. Gundry, A.B., M.D., Assistant Professor of Medicine.

Walter L. Hard, Ph.D., Assistant Professor of Histology.

\*Harry C. Hull, M.D., Assistant Professor of Surgery.

Albert Jaffe, M.D., Assistant Professor of Pediatrics.

John E. Legge, M.D., Assistant Professor of Medicine.

John F. Lutz, A.B., M.D., Assistant Professor of Histology.

\*Walter C. Merkel, A.B., M.D., Assistant Professor of Pathology.



Zachariah Morgan, M.D., Assistant Professor of Gastro-Enterology.

\*Samuel Morrison, A.B., M.D., Assistant Professor of Gastro-Enterology.

\*Harry M. Murdock, B.S., M.D., Assistant Professor of Psychiatry.

George McLean, M.D., Assistant Professor of Medicine.

\*H. W. Newell, M.D., Assistant Professor of Psychiatry.

M. Alexander Novey, A.B., M.D., Assistant Professor of Obstetrics.

Benjamin Pushkin, M.D., Assistant Professor of Neurology.

J. G. M. Reese, M.D., Assistant Professor of Obstetrics.

\*Harry M. Robinson, Jr., B.S., M.D., \*Assistant Professor of Dermatology, Assistant in Medicine.

Milton S. Sacks, B.S., M.D., Assistant Professor of Medicine and Head of Clinical Pathology.

Isadore A. Siegel, A.B., M.D., Assistant Professor of Obstetrics.

Edward P. Smith, M.D., Ph.G., Assistant Professor of Gynecology.

Frederick B. Smith, M.D., Assistant Professor of Pediatrics.

George A. Strauss, Jr., M.D., Assistant Professor of Gynecology.

John H. Traband, M.D., Assistant Professor of Pediatrics.

William H. F. Warthen, A.B., M.D., Assistant Professor of Hygiene and Public Health.

Glenn S. Weiland, Ph.D., Assistant Professor of Biological Chemistry.

J. Herbert Wilkerson, M.D., Assistant Professor of Oral Surgery.

Thomas C. Wolff, Litt.B., M.D., C.M., Assistant Professor of Medicine.

### LECTURERS

W. N. Bispham, Col., M.C., U.S.A. (ret.), Lecturer in Medicine.

Jonas Friedenwald, M.A., M.D., Lecturer in Ophthalmic Pathology.

Charles R. Goldsborough, M.A., M.D., Lecturer in Medicine.

\*Leslie B. Hohman, M.D., Lecturer in Psychiatry.

Clark H. Yeager, M.D., Dr. P.H., Lecturer in Tropical Medicine.

### ASSOCIATES

§John R. Abercrombie, A.B., M.D., Associate in Dermatology.

\*Thurston R. Adams, M.D., Associate in Surgery and Diseases of the Rectum and Colon.

\*James G. Arnold, Jr., M.D., Associate in Neurological Surgery.

Margaret B. Ballard, M.D., Associate in Obstetrics.

Dudley P. Bowe, A.B., M.D., Associate in Obstetrics.

\*Kenneth B. Boyd, M.D., Associate in Gynecology and Assistant in Obstetrics.

\*Simon H. Brager, M.D., Associate in Surgery.

Beverly C. Compton, A.B., M.D., Associate in Gynecology.

\*Murray M. Copeland, M.D., Associate in Surgery.

W. A. H. Councill, M.D., Associate in Genito-Urinary Surgery.

E. Eugene Covington, M.D., Associate in Surgical Anatomy and Surgery.

John C. Dumlér, B.S., M.D., Associate in Gynecology.

†William W. Elgin, M.D., Associate in Psychiatry.

\*J. J. Erwin, M.D., Associate in Gynecology.

Houston Everett, M.D., Associate in Gynecology.

L. K. Fargo, M.D., Associate in Genito-Urinary Surgery.

Wetherbee Fort, M.D., Associate in Medicine.

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§Died August 3, 1944.

- Frank J. Geraghty, A.B., M.D., Associate in Medicine.  
 Francis W. Gillis, M.D., Associate in Genito-Urinary Surgery.  
 Samuel S. Glick, M.D., Associate in Pediatrics.  
 Albert E. Goldstein, M.D., Associate in Pathology.  
 Raymond F. Helfrich, A.B., M.D., Associate in Surgery.  
 John T. Hibbitts, M.D., Associate in Gynecology.  
 John F. Hogan, M.D., Associate in Genito-Urinary Surgery.  
 Z. Vance Hooper, M.D., Associate in Gastro-Enterology.  
 Clewell Howell, B.S., M.D., Associate in Pediatrics.  
 †N. M. Kanof, M.D., Associate in Dermatology.  
 Joseph I. Kemler, M.D., Associate in Ophthalmology.  
 Frank B. Kindell, A.B., M.D., Associate in Pathology.  
 F. Edwin Knowles, Jr., M.D., Associate in Ophthalmology.  
 \*Harry V. Langeltuttig, A.B., M.D., Associate in Medicine.  
 \*Luther E. Little, M.D., Associate in Surgery.  
 G. Bowers Mansdorfer, B.S., M.D., Associate in Pediatrics.  
 L. J. Millan, M.D., Associate in Genito-Urinary Surgery.  
 W. Raymond McKenzie, M.D., Associate in Rhinology and Laryngology.  
 James W. Nelson, M.D., Associate in Surgery.  
 Frank N. Ogden, M.D., Associate in Biological Chemistry.  
 Benjamin S. Rich, A.B., M.D., Associate in Otolaryngology and in Rhinology and Laryngology.  
 I. O. Ridgely, M.S., M.D., Associate in Surgery.  
 \*John E. Savage, B.S., M.D., Associate in Obstetrics.  
 William M. Seabold, A.B., M.D., Associate in Pediatrics.  
 William B. Settle, M.D., Associate in Surgery†, Instructor in Gynecology, and Assistant in Gross Anatomy.  
 \*Richard T. Shackelford, A.B., M.D., Associate in Surgery.  
 \*Harry S. Shelley, B.S., M.D., Associate in Genito-Urinary Surgery.  
 †Joseph Sindler, M.D., Associate in Gastro-Enterology.  
 Sol Smith, M.D., Associate in Medicine.  
 Cleo D. Stiles, M.D., Associate in Rhinology and Laryngology, and Assistant in Otolaryngology.  
 E. H. Tonolla, M.D., Associate in Medicine.  
 \*I. Ridgeway Trimble, M.D., Associate in Surgery.  
 \*John A. Wagner, B.S., M.D., Associate in Pathology, Assistant in Medicine.  
 Austin H. Wood, M.D., Associate in Genito-Urinary Surgery.

## INSTRUCTORS

- \*Conrad B. Acton, Instructor in Medicine and Assistant in Pathology.  
 Marie A. Andersch, Ph.D., Instructor in Medicine.  
 \*A. Russell Anderson, M.D., Instructor in Psychiatry.  
 Thomas S. Bowyer, A.B., M.D., Instructor in Gynecology and Assistant in Obstetrics.  
 Ann Virginia Brown, A.B., Instructor in Biological Chemistry.  
 \*Henry F. Buettner, M.D., Instructor in Bacteriology.  
 \*M. Paul Byerly, M.D., Instructor in Pediatrics.  
 †Lucile J. Caldwell, M.D., Instructor in Dermatology.  
 \*Ernest I. Cornbrooks, Jr., A.B., M.D., Instructor in Gynecology.  
 \*Edward F. Cotter, M.D., Instructor in Pathology, Assistant in Neurology.  
 †J. G. N. Cushing, M.D., Instructor in Psychiatry.  
 \*B. Matthew Debuskey, M.D., Instructor in Pediatrics.  
 W. Allen Deckert, A.B., M.D., Instructor in Gynecology and Assistant in Surgery and Obstetrics.

S. J. Demarco, M.D., Instructor in Surgery.

\*Francis G. Dickey, A.B., M.D., Instructor in Medicine.

William K. Diehl, B.S., M.D., Instructor in Gynecology.

Ernest S. Edlow, A.B., M.D., Instructor in Gynecology.

\*William L. Fearing, M.D., Instructor in Neurology.

\*Jerome Fineman, M.D., Instructor in Pediatrics.

\*Philip D. Flynn, M.D., Instructor in Medicine.

\*Irving Freeman, B.S., M.D., Instructor in Medicine.

†Frederic A. Glass, M.D., Instructor in Dermatology.

Robert L. Graham, A.B., M.D., Instructor in Pathology.

E. M. Hanrahan, A.B., M.D., Instructor in Surgery.

\*William G. Helfrich, B.S., M.D., Instructor in Medicine.

\*Samuel T. Helms, B.S., M.D., Instructor in Medicine and Genito-Urinary Surgery.

W. Grafton Hersperger, A.B., M.D., Instructor in Medicine.

†J. Frank Hewitt, A.B., M.D., Instructor in Surgery.

\*F. A. Holden, M.D., Instructor in Ophthalmology.

Calvin Hyman, M.D., Instructor in Surgery.

\*B. Wallace Inman, D.D.S., Instructor in Oral Surgery.

Conrad L. Inman, D.D.S., Instructor in Oral Surgery.

Meyer W. Jacobson, M.D., Instructor in Medicine.

Joye J. Jennings, A.B., Instructor in Physiology.

William R. Johnson, M.D., Instructor in Surgery.

\*Edward S. Kallins, B.S., M.D., Instructor in Medicine.

\*Clyde F. Karns, B.S., M.D., Instructor in Surgery.

\*Lester N. Kolman, M.D., Instructor in Dermatology.

Vernon E. Krah, B.S., M.S., Instructor in Gross Anatomy.

\*A. Kremen, A.B., M.D., Instructor in Ophthalmology.

Milton C. Lang, M.D., Instructor in Ophthalmology.

C. Edward Leach, M.D., Instructor in Medicine.

Samuel Legum, A.B., M.D., Instructor in Medicine.

Philip F. Lerner, A.B., M.D., Instructor in Neurology.

H. Edmund Levin, B.S., M.D., Instructor in Medicine and Bacteriology.

Kurt Levy, M.D., Instructor in Medicine.

Hans W. Loewald, M.D., Instructor in Psychiatry.

I. H. Maseritz, M.D., Instructor in Orthopaedic Surgery.

\*Howard B. Mays, M.D., Instructor in Genito-Urinary Surgery and Assistant in Pathology.

\*R. B. Mitchell, Jr., B.S., M.D., Instructor in Medicine.

J. Duer Moores, B.S., M.D., Instructor in Surgery.

\*Frank K. Morris, A.B., M.D., Instructor in Gynecology and Obstetrics.

Ruth Musser, M.S., Instructor in Pharmacology.

John A. Myers, M.E.E., M.D., Instructor in Medicine, Assistant in Gastro-Enterology.

†Francis McLaughlin, M.D., Instructor in Psychiatry.

Hugh B. McNally, B.S., M.D., Instructor in Obstetrics.

†Samuel Novey, M.D., Instructor in Psychiatry.

\*Herbert E. Reifschneider, A.B., M.D., Instructor in Oral Surgery and Assistant in Surgery.

\*Dexter L. Reimann, B.S., M.D., Instructor in Pathology, Assistant in Medicine.

Robert A. Reiter, A.B., M.D., Instructor in Medicine.

†Charles Schmidt, M.D., Instructor in Psychiatry.

Lawrence M. Serra, M.D., Instructor in Medicine.

- \*M. S. Shiling, A.B., M.D., D.Sc., Instructor in Medicine.  
 Albert J. Shochat, B.S., M.D., Instructor in Gastro-Enterology.  
 \*Arthur G. Siwinski, A.B., M.D., Instructor in Surgery.  
 \*Benedict Skitarelic, A.B., M.D., Instructor in Pathology, and Assistant in Medicine.  
 \*Karl J. Steinmueller, A.B., M.D., Instructor in Surgery.  
 \*Harry A. Teitelbaum, B.S., M.D., Instructor in Gross Anatomy, Assistant in Neurology.  
 David Tenner, M.D., Instructor in Medicine.  
 Dorsey R. Tipton, D.D.S., Instructor in Oral Surgery.  
 ‡James E. P. Toman, A.B., Ph.D., Instructor in Physiology.  
 Myron G. Tull, A.B., M.D., Instructor in Hygiene and Public Health.  
 \*Philip S. Wagner, M.D., Instructor in Psychiatry.  
 W. Wallace Walker, M.D., Instructor in Surgical Anatomy and Surgery.  
 \*Gibson J. Wells, A.B., M.D., Instructor in Pediatrics.  
 \*Hugh G. Whitehead, M.D., Instructor in Medicine.  
 Henry L. Wollenweber, M.D., Instructor in Pathology, Assistant in Pharmacology.

### ASSISTANTS

- \*J. Warren Albright, B.S., M.D., Assistant in Obstetrics.  
 Leon Ashman, M.D., Assistant in Medicine.  
 \*John L. Atkins, A.B., M.D., Assistant in Medicine.  
 †Donald J. Barnett, M.D., Assistant in Roentgenology.  
 Nathaniel M. Beck, A.B., M.D., Assistant in Medicine and Gastro-Enterology.  
 \*Joseph M. Blumberg, B.S., M.D., Assistant in Medicine.  
 \*Harry C. Bowie, B.S., M.D., Assistant in Surgical Anatomy and Surgery.  
 †Alma Braun, M.D., Assistant in Obstetrics.  
 \*George H. Brouillet, B.S., M.D., Assistant in Surgery.  
 A. V. Buchness, A.B., M.D., Assistant in Surgery.  
 Harold H. Burns, M.D., Assistant in Surgery.  
 \*Paul E. Carliner, B.S., M.D., Assistant in Medicine.  
 †Anthony F. Carozza, M.D., Assistant in Medicine.  
 L. T. Chance, M.D., Assistant in Surgery.  
 \*William S. Cheney, M.D., Assistant in Surgery.  
 Robert F. Chenowith, M.D., Assistant in Surgery.  
 Mary E. Chinn, A.B., Assistant in Physiology.  
 \*Stuart G. Coughlan, B.S., M.D., Assistant in Surgery.  
 \*Robert C. Crawford, A.B., M.D., Assistant in Medicine.  
 Samuel H. Culver, M.D., Assistant in Surgery.  
 \*Dwight M. Currie, A.B., M.D., Assistant in Surgery.  
 \*Daniel I. Dann, M.D., Assistant in Obstetrics.  
 \*Edwin O. Daue, Jr., B.S., M.D., Assistant in Medicine.  
 \*Nachman Davidson, A.B., M.D., Assistant in Medicine.  
 E. Hollister Davis, A.B., M.D., Assistant in Anaesthesia.  
 \*George H. Davis, M.D., Assistant in Obstetrics.  
 \*Everett S. Diggs, B.S., M.D., Assistant in Gynecology.  
 D. McClelland Dixon, M.D., Assistant in Obstetrics and Pathology.  
 Charles H. Doeller, Jr., A.B., M.D., Assistant in Obstetrics.  
 †H. C. Donahoo, Jr., M.D., Assistant in Obstetrics.  
 Bernard W. Donohue, M.D., Assistant in Obstetrics.  
 Robert D. Duncan, M.D., ‡Assistant in Surgery, Assistant in Gross Anatomy.



- †Thomas B. Dunne, A.B., M.D., Assistant in Obstetrics.  
 Morris A. Fine, M.D., Assistant in Medicine and Genito-Urinary Surgery.  
 Herbert M. Foster, M.D., Assistant in Surgery.  
 \*†Edward L. Frey, Jr., A.B., M.D., Assistant in Medicine.  
 †Audrey M. Funk, A.B., Assistant in Medicine.  
 L. Calvin Gareis, B.S., M.D., Assistant in Obstetrics.  
 \*William M. Garlick, A.B., M.D., Assistant in Surgery.  
 Jason H. Gaskell, M.D., Assistant in Orthopaedic Surgery.  
 \*Robert L. Gibbs, A.B., M.D., Assistant in Medicine.  
 \*Marion H. Gillis, M.D., Assistant in Ophthalmology.  
 \*Robert J. Gore, M.D., Assistant in Pediatrics.  
 George Govatos, A.B., M.D., Assistant in Surgery.  
 †Richard L. Goyne, B.S., M.D., Assistant in Obstetrics.  
 \*H. L. Granoff, A.B., M.D., Assistant in Gynecology.  
 William H. Grenzer, M.D., Assistant in Medicine.  
 \*Joseph B. Gross, B.S., M.D., Assistant in Medicine.  
 \*Donald B. Grove, M.D., Assistant in Surgery.  
 \*Samuel J. Hankin, M.D., Assistant in Medicine.  
 †Mary L. Hayleck, M.D., Assistant in Pediatrics.  
 Robert F. Healy, M.D., Assistant in Surgery.  
 \*Thomas A. Hedrick, M.D., Assistant in Pediatrics.  
 †Jeannette R. Heghinian, B.S., M.D., Assistant in Dermatology.  
 L. Ann Hellen, B.S., Assistant in Medicine.  
 \*Benjamin Highstein, M.D., Assistant in Dermatology.  
 Samuel L. Fox, M.D., Assistant in Rhinology and Laryngology.  
 William R. Geraghty, B.S., M.D., Assistant in Surgery.  
 †John H. Hirschfeld, M.D., Assistant in Rhinology and Laryngology.  
 \*Mark Hollander, M.D., Assistant in Dermatology.  
 John V. Hopkins, M.D., Assistant in Orthopaedic Surgery.  
 Rollin C. Hudson, M.D., Assistant in Dermatology.  
 \*Jaroslav Hulla, M.D., Assistant in Obstetrics.  
 \*William C. Humphries, M.D., Assistant in Rhinology and Laryngology.  
 \*Oliver A. James, M.D., Assistant in Surgery.  
 \*Jacob R. Jensen, B.S., M.D., Assistant in Obstetrics.  
 \*Joseph V. Jerardi, B.S., M.D., Assistant in Surgery.  
 \*Hugh Jewett, M.D., Assistant in Genito-Urinary Surgery.  
 Marius P. Johnson, A.B., M.D., Assistant in Obstetrics.  
 †Edward G. Jones, A.B., M.D., Assistant in Gynecology.  
 \*Ferd E. Kadan, A.B., M.D., Assistant in Obstetrics.  
 D. Frank Kaltreider, M.D., Assistant in Obstetrics.  
 \*William H. Kammer, Jr., A.B., M.D., Assistant in Medicine.  
 \*Arthur Karfgin, B.S., M.D., Assistant in Medicine.  
 \*James R. Karns, B.S., M.D., Assistant in Medicine.  
 \*Lawrence Katzenstein, M.D., Assistant in Medicine.  
 F. A. Kayser, M.D., Assistant in Rhinology and Laryngology.  
 \*Lauriston L. Keown, A.B., M.D., Assistant in Pediatrics.  
 \*Howard F. Kinnamon, Jr., M.D., Assistant in Surgery.  
 \*Charles W. Knerler, M.D., Assistant in Medicine.  
 \*Schuyler G. Kohn, B.S., M.D., Assistant in Obstetrics.  
 Louis J. Kroll, A.B., M.D., Assistant in Medicine.  
 Frederick T. Kyper, M.D., Sc.D., Assistant in Rhinology and Laryngology.

- ‡Arnold F. Lavenstein, M.D., Assistant in Pediatrics.  
 †Alfred S. Lederman, Assistant in Gastro-Enterology.  
 \*Ephraim T. Lisansky, A.B., M.D., Assistant in Pathology and Medicine.  
 \*William B. Long, Jr., B.S., M.D., Assistant in Orthopaedic Surgery.  
 ‡William C. Lowe, B.S., M.D., Assistant in Medicine.  
 \*H. Pearce Maccubbin, B.S., M.D., Assistant in Medicine.  
 \*John W. Machen, M.D., Assistant in Neurology.  
 \*Ernest W. Mack, M.D., Assistant in Surgery.  
 Helen I. Maginnis, M.D., Assistant in Gynecology.  
 \*W. Kenneth Mansfield, Jr., M.D., Assistant in Obstetrics.  
 Maxwell L. Mazer, M.D., Assistant in Obstetrics.  
 \*Robert B. Mearns, M.D., Assistant in Medicine.  
 \*Karl F. Mech, B.S., M.D., Assistant in Pathology.  
 George C. Medairy, M.D., Assistant in Neurology.  
 \*Israel P. Meranski, B.S., M.D., Assistant in Pediatrics.  
 \*John H. Morrison, B.S., M.D., Assistant in Obstetrics.  
 \*S. Edwin Muller, M.D., Assistant in Medicine.  
 \*Joseph E. Muse, Jr., B.S., M.D., Assistant in Medicine.  
 Howard B. McElwain, M.D., Assistant in Surgery.  
 \*William W. McKinney, M.D., Assistant in Neurological Surgery.  
 Samuel McLanahan, Jr., A.B., M.D., Assistant in Surgery.  
 J. Edward Norris, M.D., Assistant in Obstetrics.  
 Richard S. Owens, M.D., Assistant in Otology.  
 \*William A. Parr, M.D., Assistant in Otology.  
 Leslie Harrell Pierce, B.S., M.D., Assistant in Medicine.  
 \*Samuel E. Proctor, A.B., M.D., Assistant in Surgery.  
 \*†Charles W. Reavis, M.D., Assistant in Roentgenology.  
 \*Samuel T. R. Revell, B.S., M.D., Assistant in Medicine.  
 \*Henry L. Rigdon, M.D., Assistant in Surgery.  
 \*Daniel R. Robinson, M.D., Assistant in Surgery.  
 \*†Donald J. Roop, M.D., Assistant in Medicine.  
 \*†John D. Rosin, B.S., M.D., Assistant in Obstetrics.  
 ‡Thomas E. Russell, B.S., M.D., Assistant in Obstetrics.  
 \*Clarence P. Scarborough, M.D., Assistant in Surgery.  
 \*John F. Schaeffer, B.S., M.D., Assistant in Surgery.  
 W. J. Schmitz, M.D., Assistant in Pediatrics.  
 \*Theodore A. Schwartz, M.D., Assistant in Rhinology and Laryngology.  
 \*Earle S. Scott, M.D., Assistant in Pediatrics.  
 \*J. King B. E. Seegar, Jr., A.B., M.D., Assistant in Obstetrics.  
 \*George Silverton, A.B., M.D., Assistant in Medicine.  
 \*Jerome Snyder, B.S., M.D., Assistant in Ophthalmology.  
 Samuel Snyder, M.D., Assistant in Medicine.  
 \*Solomon Tanenbaum, M.D., Assistant in Dermatology.  
 T. J. Touhey, M.D., Assistant in Surgery.  
 Wilfred H. Townshend, Jr., A.B., M.D., Assistant in Medicine.  
 \*W. H. Triplett, M.D., Assistant in Medicine.  
 \*Hugh H. Trout, Jr., M.D., Assistant in Surgery.  
 \*Frederick W. Wagnitz, M.D., Assistant in Surgery.  
 \*William K. Waller, A.B., M.D., Assistant in Medicine.  
 William Earl Weeks, M.D., Assistant in Pediatrics.  
 Albert R. Wilkerson, M.D., Assistant in Surgery.

Daniel Wilfson, Jr., A.B., M.D., Assistant in Medicine.

†Thomas L. Wilson, M.D., Assistant in Gynecology.

### FELLOWS

Jane Louise Banker, A.B., Weaver Fellow in Biological Chemistry.

Frederick K. Bell, Ph.D., U. S. Pharmacopoeia Fellow.

‡Dorothy Bizzell, American Philosophical Society Fellow in Physiology.

‡William K. Diehl, B.S., M.D., Hitchcock Fellow in Gynecology.

†Harry K. Ivamoto, Ph.D., Emerson Fellow in Pharmacology.

†Ruth B. Law, B.S., Weaver Fellow in Histology and Embryology.

‡Edith W. Moulton, A.B., M.S., Fellow in Pharmacology.

†Margaret Virginia Palmer, A.M., M.D., Hitchcock Fellow in Medicine.

‡Leslie Harrell Pierce, B.S., M.D., Hitchcock Fellow in Medicine.

\*†C. Martin Rhode, A.B., M.D., Weaver Fellow in Physiology.

Dorothy K. Shipley, M.S., Fellow in Pharmacology.

†Wilfred H. Townshend, Jr., A.B., M.D., Hitchcock Fellow in Medicine.

John A. Wagner, B.S., M.D., Hitchcock Fellow in Neurological Surgery.

†Virginia M. Waters, A.B., Emerson Fellow in Pharmacology.

## UNIVERSITY HOSPITAL

## EXECUTIVE COMMITTEE OF THE STAFF

ROB'T. U. PATTERSON, *Superintendent*HAROLD A. SAYLES, *Assistant Superintendent**Alternates*THOMAS P. SPRUNT, *Chairman*

ARTHUR M. SHIPLEY

LOUIS H. DOUGLASS

J. MASON HUNDLEY, JR.

CLYDE A. CLAPP

EDWARD A. LOOPER

HENRY J. WALTON

C. LORING JOSLIN

WILLIAM M. SEABOLD, *Secretary*

T. NELSON CAREY

CHARLES REID EDWARDS

J. G. M. REESE

BEVERLEY C. COMPTON

HENRY F. GRAFF

THOMAS R. O'ROURK

CHARLES N. DAVIDSON

J. EDMUND BRADLEY

## UNIVERSITY HOSPITAL STAFF

ROB'T. U. PATTERSON, *Superintendent*HAROLD A. SAYLES, *Assistant Superintendent**Physician-in-Chief*.....\*MAURICE C. PINCOFFS*Acting Physician-in-Chief*.....THOMAS P. SPRUNT

<i>Physicians</i> .....	{	WALTER A. BAETJER
		THOMAS P. SPRUNT
		JOHN E. LEGGE
		*LOUIS A. M. KRAUSE
		G. CARROLL LOCKARD
		JOSEPH E. GICHNER
		WILLIAM H. SMITH
		*WILLIAM S. LOVE, JR.
	{	T. NELSON CAREY
		*RAYMOND HUSSEY

*Gastro-Enterologist*.....ZACHARIAH R. MORGAN

<i>Neurologists</i> .....	{	IRVING J. SPEAR
		LEON FREEDOM

<i>Psychiatrists</i> .....	{	ROSS MCC. CHAPMAN
		RALPH P. TRUITT
		*HARRY M. MURDOCK

<i>Pediatricians</i> .....	{	C. LORING JOSLIN
		ALBERT JAFFE
		J. EDMUND BRADLEY
		†A. H. FINKELSTEIN
		†WILLIAM M. SEABOLD

*Pathologist*..... HUGH R. SPENCER*Surgeon-in-Chief*..... ARTHUR M. SHIPLEY



<i>Surgeons</i> .....	{ CHARLES REID EDWARDS PAGE EDMUNDS THOMAS B. AYCOCK
<i>Neurological Surgeons</i> .....	{ CHARLES BAGLEY, JR. RICHARD G. COBLENTZ
<i>Laryngologists</i> .....	{ EDWARD A. LOOPER FRANKLIN B. ANDERSON THOMAS R. O'ROURK
<i>Proctologists</i> .....	{ †J. DAWSON REEDER ★MONTE EDWARDS
<i>Orthopaedic Surgeons</i> .....	{ ALLEN FISKE VOSHELL MOSES GELLMAN COMPTON RIELY ★HENRY F. ULLRICH
<i>Genito-Urinary Surgeons</i> .....	{ W. HOUSTON TOLSON W. A. H. COUNCILL LYLE J. MILLAN ★HARRY S. SHELLEY ★HOWARD B. MAYS
<i>Roentgenologists</i> .....	{ HENRY J. WALTON ★WALTER L. KILBY CHARLES N. DAVIDSON †DONALD J. BARNETT
<i>Dermatologist</i> .....	HARRY M. ROBINSON, SR.
<i>Bronchoscopist</i> .....	EDWARD A. LOOPER
<i>Otologist</i> .....	
<i>Anaesthetists</i> .....	{ E. HOLLISTER DAVIS MARY J. O'BRIEN, R.N. RUTH ELLIOTT, R.N. ROSE L. FURLONG, R.N.
<i>Obstetricians</i> .....	{ LOUIS H. DOUGLASS M. A. NOVEY ISADORE A. SIEGEL J. G. M. REESE ★JOHN E. SAVAGE †HUGH B. McNALLY
<i>Ophthalmologists</i> .....	{ CLYDE A. CLAPP HENRY F. GRAFF †F. EDWIN KNOWLES, JR.
<i>Gynecologists</i> .....	{ J. MASON HUNDLEY, JR. LEO BRADY BEVERLEY C. COMPTON
<i>Oncologists</i> .....	{ J. MASON HUNDLEY, JR. GRANT E. WARD

## ANNUAL HOSPITAL APPOINTMENTS

The following annual appointments\* are made to the University Hospital:

Four Residents in Medicine  
Seven Residents in Surgery  
One Resident in Neurosurgery  
Three Residents in Gynecology

Four Residents in Obstetrics  
Two Residents in Pediatrics  
One Resident in Otorhinolaryngology  
One Resident in Roentgenology

Twenty-Four Rotating Interns

\* The number of appointments has been reduced during the war as required by Headquarters of Procurement and Assignment Service, Washington, D. C.

## UNIVERSITY HOSPITAL RESIDENT AND INTERN STAFF

JANUARY 1, 1944 – SEPTEMBER 30, 1944

## RESIDENT STAFF

\*JOSEPH G. BIRD, B.S., M.D., *Assistant Resident Physician.*

ALMA C. BRAUN, B.S., M.D., *Assistant Resident Obstetrician.*

\*HENRY A. BRIELE, M.D., *Resident Surgeon.*

<sup>1</sup>ARISTO J. BRIZZOLARA, M.D., *Assistant Resident Otorhinolaryngologist.*

\*WILLIAM L. BYERLY, JR., B.S., M.D., *Assistant Resident Surgeon.*

\*<sup>2</sup>GEORGE H. DAVIS, B.S., M.D., *Resident Obstetrician.*

THOMAS B. DUNNE, A.B., M.D., *Assistant Resident Obstetrician.*

\*WILLIAM H. FISHER, M.D., *Resident Surgeon.*

\*CHARLES C. GARDNER, A.B., M.D., *Assistant Resident Surgeon.*

E. MILDRED GREGORY, M.D., *Assistant Resident Surgeon.*

WILLIAM B. HAGAN, B.S., M.D., *Assistant Resident Surgeon.*

\*THOMAS A. HEDRICK, M.D., *Assistant Resident Pediatrician.*

ALVIN H. HONIGMAN, B.S., M.D., *Assistant Resident Physician.*

\*BENJAMIN H. INLOES, JR., M.D., *Resident Gynecologist.*

<sup>4</sup>EDWARD G. JONES, A.B., M.D., *Resident Gynecologist.*

THEODORE KARDASH, B.S., M.D., *Assistant and Acting Resident Gynecologist.*

\*SCHUYLER KOHN, B.S., M.D., *Resident Obstetrician.*

\*WILLIAM H. LEITCH, B.S., M.D., *Assistant Resident Surgeon.*

\*FOREST C. MEADE, M.D., *Assistant Resident Surgeon.*

JOHN H. MORRISON, B.S., M.D., *Resident Obstetrician.*

<sup>5</sup>MARGARET V. PALMER, A.M., M.D., *Assistant Resident Physician.*

\*JOHN O. ROBBEN, B.S., M.D., *Assistant Resident Surgeon.*

FRANCIS F. RUZICKA, JR., A.B., M.D., *Assistant Resident Roentgenologist.*

\* January 1, 1944 to June 30, 1944—Left to enter Armed Services.

<sup>1</sup> April 1, 1944 to September 30, 1944.

<sup>2</sup> January 1, 1944 to March 31, 1944—Left to enter Army.

<sup>3</sup> July 1–31, 1944. Withdrew—Illness.

<sup>4</sup> Acting Resident since July 1, 1944.

<sup>5</sup> July 1, 1943–June 30, 1944.

<sup>6</sup> July 1, 1944–June 30, 1945.

<sup>7</sup>E. RODERICK SHIPLEY, A.B., M.D., *Assistant and Acting Resident Surgeon.*

EDWIN H. STEWART, JR., M.D., *Assistant Resident Surgeon.*

\*RAYMOND K. THOMPSON, B.S., M.D., *Resident Neurosurgeon.*

WILFRED H. TOWNSEND, JR., A.B., M.D., *Resident Physician.*

WILLIAM E. WEEKS, B.S., M.D., *Resident Pediatrician.*

\*RICHARD T. WILLIAMS, A.B., M.D., *Assistant Resident Surgeon.*

THOMAS L. WILSON, M.D., *Assistant Resident Gynecologist.*

DAVID K. WORGAN, B.S., M.D., *Assistant Resident Surgeon.*

#### INTERNS

WILLIAM N. CORPENING, A.B., M.D.

HENRY V. GUHLEMAN, JR., A.B., M.D.

JOHN S. HAUGHT, A.B., M.D.

CHARLES H. INGRAM, A.B., M.D.

<sup>8</sup>MELVIN J. JAWORSKI, B.S., M.D.

CHARLES A. KEMPER, A.B., M.D.

CLARENCE V. LATIMER, JR., A.B., M.D.

WILLIAM D. LYNN, A.B., M.D.

A. ROBERT MARKS, A.B., M.D.

ALFRED T. NELSON, M.D.

EDWARD P. PALMASON, B.S., M.D.

IARVIS D. PASCHAL, B.S., M.D.

E. THORNTON PFEIL, JR., B.S., M.D.

JAMES J. RANGE, A.B., M.D.

CLIFF RATLIFF, JR., A.B., M.D.

ARTHUR M. RINEHART, B.S., M.D.

MERRITT E. ROBERTSON, A.B., M.D.

FRANK M. SHIPLEY, A.B., M.D.

JAMES S. SHORTLE, B.S., M.D.

F. MASON SONES, JR., A.B., M.D.

MARTIN E. STROBEL, A.B., M.D.

GLENN O. SUMMERLIN, M.D.

<sup>9</sup>TALMADGE S. THOMPSON, M.D.

LEROY W. TILT, JR., A.B., M.D.

#### DENTAL INTERN

<sup>10</sup>WILBUR O. RAMSEY, D.D.S.

#### ANNOUNCEMENT OF

#### UNIVERSITY HOSPITAL RESIDENT AND INTERN STAFF

OCTOBER 1, 1944 TO JUNE 30, 1945

#### RESIDENT STAFF

ALMA C. BRAUN, B.S., M.D., *Resident Obstetrician.*

JOSEPH DeLUCA, B.S., M.D., *Assistant Resident Surgeon.*

THOMAS B. DUNNE, A.B., M.D., *Resident Obstetrician.*

WILLIAM B. HAGAN, B.S., M.D., *Assistant Resident Surgeon.*

JOHN S. HAUGHT, A.B., M.D., *Assistant Resident Gynecologist.*

CHARLES H. INGRAM, A.B., M.D., *Assistant Resident Physician.*

WILLIAM D. LYNN, A.B., M.D., *Assistant Resident Surgeon.*

A. ROBERT MARKS, A.B., M.D., *Assistant Resident Pediatrician.*

ALFRED T. NELSON, M.D., *Assistant Resident Surgeon.*

EDWARD P. PALMASON, B.S., M.D., *Assistant Resident Surgeon.*

MARGARET V. PALMER, A.M., M.D., *Resident Physician.*

<sup>7</sup> Acting Resident since July 1, 1944.

<sup>8</sup> January 1, 1944 to March 7, 1944.

<sup>9</sup> January 1, 1944 to February 29, 1944—Left because of illness.

<sup>10</sup> December 1, 1943 to October 31, 1944.

JARVIS D. PASCHAL, B.S., M.D., *Assistant Resident Obstetrician.*  
 E. THORNTON PFEIL, JR., B.S., M.D., *Assistant Resident Surgeon.*  
<sup>1</sup>JOHN O. ROBBEN, M.D., *Assistant Resident Surgeon.*  
 FRANCIS F. RUZICKA, JR., A.B., M.D., *Resident Roentgenologist.*  
 E. RODERICK SHIPLEY, A.B., M.D., *Resident Surgeon.*  
 FRANK M. SHIPLEY, A.B., M.D., *Assistant Resident Physician.*  
 JAMES S. SHORTLE, B.S., M.D., *Assistant Resident Obstetrician.*  
 EDWIN H. STEWART, JR., M.D., *Assistant Resident Surgeon.*  
 LEROY W. TILT, JR., A.B., M.D., *Assistant Resident Gynecologist.*  
 J. CARLTON WICH, B.S., M.D., *Assistant Resident Pediatrician.*  
 THOMAS L. WILSON, M.D., *Resident Gynecologist.*

#### INTERNS

KENNETH M. BROWNE, M.D.	PERRY FUTTERMAN, A.B., M.D.
CHARLES D. CHAPUT, A.B., M.D.	DONALD F. GLEASON, A.B., M.D.
ROWELL C. CLONINGER, A.B., M.D.	MARVIN GOLDSTEIN, A.B., M.D.
CHARLES E. COTTELL, B.S., M.D.	ERNEST G. GUY, B.S., M.D.
R. ADAMS COWLEY, M.D.	HENRY W. HÖLLJES, A.B., M.D.
PATRICIA DODD, B.S., M.D.	HELEN A. HORN, A.B., M.D.
MILES E. DRAKE, PH.D., M.D.	JOHN M. JERNIGAN, JR., B.S., M.D.
WILLIAM C. EBELING III, B.S., M.D.	DONALD W. MINTZER, B.S., M.D.
THOMAS G. ELIAS, A.B., M.D.	WILLIAM H. MOSBERG, JR., B.S., M.D.
OTTO R. EMIG, B.S., M.D.	RICHARD B. NORMENT III, B.S., M.D.
RUSSELL L. FANKHOUSER, A.B., M.D.	GEORGE M. SIMONS, B.S., M.D.
WILBUR H. FOARD, M.D.	MILLARD T. TRABAND, JR., B.S., M.D.

#### DENTAL INTERN

(To be appointed)

#### UNIVERSITY HOSPITAL DISPENSARY STAFF

EMMA WINSHIP, R.N.

*Dispensary Director*

#### DISPENSARY COMMITTEE

JOHN E. LEGGE, *Chairman*

EMMA WINSHIP, R.N., *Secretary*

LOUIS H. DOUGLASS  
 J. MASON HUNDLEY, JR.  
 C. LORING JOSLIN

★JOHN E. SAVAGE  
 ★GEORGE H. YEAGER  
 RALPH P. TRUITT

*Chief of Medical Clinic*.....JOHN E. LEGGE

*Assistant Chiefs of Medical Clinic*.....

{	★LEWIS P. GUNDRY
	★IRVING FREEMAN
	KURT LEVY
	SAMUEL LEGUM

<sup>1</sup> July 1, 1944 to June 30, 1945.



	{ M. A. FINE
	CHARLES R. GOLDSBOROUGH
	MEYER W. JACOBSON
	*M. PAUL BYERLY
	*SAMUEL J. HANKIN
Physicians.....	†ANTHONY F. CAROZZA
	†C. VICTOR RICHARDS
	H. EDMUND LEVIN
	†THOMAS P. SPRUNT
	†G. CARROLL LOCKARD
	†MILTON S. SACKS
	†LESLIE HARRELL PIERCE
Chief of Gastro-Enterology Clinic.....	ZACHARIAH MORGAN
Assistant Chiefs of Gastro-Enterology Clinic.....	{ *FRANCIS G. DICKEY
	{ Z. VANCE HOOPER
Assistant Gastro-Enterologists.....	{ *SAMUEL MORRISON
	{ ALBERT J. SHOCHAT
	{ *CHARLES V. SEVCIK
	{ ALFRED S. LEDERMAN
Chief of Neurology Clinic.....	LEON FREEDOM
Assistant Neurologists.....	{ BENJAMIN PUSHKIN
	{ *WILLIAM L. FEARING
	{ *HARRY A. TEITELBAUM
Chief of Psychiatric Clinic.....	RALPH P. TRUITT
Assistant Psychiatrists.....	{ *H. W. NEWELL
	{ *HARRY GOLDSMITH
	{ ALICE J. ROCKWELL
	{ *JOSEPH MARSHALL
	{ *H. ROBERT BLANK
	{ †SAMUEL BARKOFF
	{ HANS W. LOEWALD
	{ *SIDNEY BERMAN
	{ MABEL WILKINS
Chief of Chest Clinic.....	E. H. TONOLLA
Assistants, Diseases of the Lungs.....	{ *MANUEL LEVIN
	{ MEYER W. JACOBSON
	{ †JOHN CONSTANTINI
	{ †CARL P. ROETLING
	{ *JOSEPH E. MUSE, JR.
	{ †HUGH J. WELCH
Chief of Metabolism Clinic.....	*LEWIS P. GUNDRY
Assistants in Metabolism Clinic.....	{ *WILLIAM G. HELFRICH
	{ *WALTER E. KARFGIN
	{ *A. GOLDMAN
	{ LOUIS V. BLUM
	{ W. GRAFTON HERSPERGER

Chief of Cardiovascular Clinic.....	*WILLIAM S. LOVE, JR.
Acting Chief of Cardiovascular Clinic.....	C. EDWARD LEACH
Assistant Chief of Cardiovascular Clinic.....	*ROBERT B. MITCHELL, JR.
	{ *SAMUEL J. HANKIN
	{ †ANTHONY F. CAROZZA
	{ *IRVING FREEMAN
Assistant Cardiologists.....	{ *HARRY M. ROBINSON, JR.
	{ *EPHRAIM T. LISANSKY
	{ F. FREDERICK RUZICKA
	{ *H. F. ERMISHAR
Chief of Allergy Clinic.....	H. M. BUBERT
Assistant Chief of Allergy Clinic.....	*EDWARD S. KALLINS
	{ SAMUEL SNYDER
Assistant Allergists.....	{ FRANK V. MANIERI
	{ *S. EDWIN MULLER
Allergy Clinic Technician.....	BETTY GERSHENSON
Directors, Pediatric Clinic.....	{ †A. H. FINKELSTEIN
	{ †C. LORING JOSLIN
	{ †SAMUEL S. GLICK
Chiefs of Pediatric Clinic.....	{ †JOHN H. TRABAND
	{ †CLEWELL HOWELL
	{ *M. PAUL BYERLY
	{ *ISRAEL P. MERANSKI
	{ WILLIAM M. SEABOLD
	{ *JEROME FINEMAN
	{ ALBERT JAFFE
	{ *LAURISTON L. KEOWN
	{ *JOSEPH R. MEYEROWITZ
Assistant Pediatricians.....	{ *GIBSON J. WELLS
	{ *ROBERT J. GORE
	{ LOUIS V. BLUM
	{ *EARLE S. SCOTT
	{ †ARNOLD F. LAVENSTEIN
	{ WILLIAM E. WEEKS
	{ *THOMAS A. HEDRICK
	{ †J. CARLTON WICH
	{ †A. ROBERT MARKS
Chief of Surgical Clinic.....	*GEORGE H. YEAGER
	{ THURSTON R. ADAMS
	{ LUTHER E. LITTLE
Assistant Surgeons.....	{ *GEORGE H. BROUILLET
	{ W. R. JOHNSON
	{ *SAMUEL E. PROCTOR
	{ *CLARENCE P. SCARBOROUGH
	{ WILLIAM B. SETTLE

<i>Chief of Orthopaedic Surgery Clinic</i> .....	ALLEN FISKE VOSHELL
	{ JOHN V. HOPKINS
	MOSES GELLMAN
<i>Assistant Orthopaedic Surgeons</i> .....	{ ★HENRY F. ULLRICH
	†FRED DUCKWALL
	†GEORGE S. APPLEBY
	†MILTON J. WILDER
<i>Chief of Genito-Urinary Clinic</i> .....	W. HOUSTON TOULSON
	{ W. A. H. COUNCILL
	JOHN F. HOGAN
<i>Assistant Genito-Urinary Surgeons</i> .....	{ LYLE J. MILLAN
	★HARRY S. SHELLEY
	★HOWARD B. MAYS
	†MORRIS A. FINE
	{ †CHARLES N. DAVIDSON
<i>Chief of Roentgenology Clinic</i> .....	†HENRY J. WALTON
	★WALTER L. KILBY
<i>Assistant Roentgenologist</i> .....	†DONALD J. BARNETT
<i>Chief of Dermatology Clinic</i> .....	HARRY M. ROBINSON, SR.
	{ ROLLIN C. HUDSON
	★HARRY M. ROBINSON, JR.
	†JEANNETTE R. HEGHINIAN
<i>Assistant Dermatologists</i> .....	{ ★LESTER N. KOLMAN
	★MARK HOLLANDER
	★BENJAMIN HIGHSTEIN
	★SOLOMON TANENBAUM
	†FREDERIC A. GLASS
<i>Chief of Rhinology and Laryngology Clinic</i> .....	BENJAMIN S. RICH
	{ JOSEPH NURKIN
	CLEO D. STILES
<i>Assistant Rhinologists and Laryngologists</i> .....	{ THOMAS R. O'ROURK
	M. BAYLUS
	FREDERICK T. KYPER
	SAMUEL L. FOX
<i>Chief of Proctology Clinic</i> .....	★MONTE EDWARDS
<i>Assistant Proctologist</i> .....	THURSTON R. ADAMS
<i>Chief of Gynecology Clinic</i> .....	J. MASON HUNDLEY, JR.
<i>Assistant Chief of Gynecology Clinic</i> .....	BEVERLEY C. COMPTON
	{ THOMAS S. BOWYER
	JOHN C. DUMLER
	JOHN T. HIBBITTS
<i>Assistant Gynecologists</i> .....	{ ★ERNEST I. CORNBROOKS,
	JR.
	WILLIAM B. SETTLE
	★KENNETH B. BOYD

Assistant Gynecologists.....	{ W. ALLEN DECKERT *EVERETT S. DIGGS HELEN I. MAGINNIS WILLIAM K. DIEHL
Female Cystoscopists.....	{ J. MASON HUNDLEY, JR. BEVERLEY C. COMPTON WILLIAM K. DIEHL
Chief of Oral Surgery Clinic.....	*BRICE M. DORSEY
Oral Surgeons.....	{ HAROLD GOLDSTEIN *SAMUEL H. BRYANT
Chief of Obstetrical Clinic.....	*JOHN E. SAVAGE
Assistant Chief of Obstetrical Clinic.....	DUDLEY P. BOWE
Assistant Obstetricians.....	{ MARGARET B. BALLARD MAXWELL L. MAZER *JAROSLAV HULLA W. ALLEN DECKERT *JOSEPH M. BLUMBERG HUGH B. McNALLY *FERD E. KADAN *JACOB R. JENSEN J. EDWARD NORRIS *J. WARREN ALBRITTAİN D. McCLELLAND DIXON *W. KENNETH MANSFIELD, JR. *DANIEL I. DANN D. FRANK KALTREIDER THOMAS S. BOWYER †RICHARD L. GOYNE *L. CALVIN GAREIS
Oncology Clinic, Gynecological Division.....	{ J. MASON HUNDLEY, JR. BEVERLEY C. COMPTON JOHN C. DUMLER WILLIAM K. DIEHL
Oncology Clinic, Surgical Division.....	{ GRANT E. WARD E. EUGENE COVINGTON J. DUER MOORES *MURRAY M. COPELAND *ARTHUR G. SIWINSKI WILLIAM K. DIEHL
Chief of Ophthalmology Clinic.....	HENRY F. GRAFF
Assistant Ophthalmologists.....	{ *FRANK A. HOLDEN †THOMAS R. O'ROURK MILTON C. LANG JEROME SNYDER
Directress, Occupational Therapy.....	MISS NANCY VALLIANT
Directress, Social Service.....	MISS GRACE PEARSON



## UNIVERSITY HOSPITAL DISPENSARY REPORT

October 1, 1942 to September 30, 1943

<i>Departments</i>	<i>New Cases</i>	<i>Old Cases</i>	<i>Total</i>
Allergy.....	91	2406	2497
Cardiology.....	135	1066	1201
Curative Workshop.....	81	997	1078
Cystoscopy.....	60	380	440
Dermatology.....	3992	10,535	14,527
Diabetic.....	53	768	821
Ear, Nose & Throat.....	1077	963	2040
Eye.....	1021	3073	4094
Gastro-Intestinal.....	172	817	989
Genito-Urinary.....	295	626	921
Gynecology.....	1361	3887	5248
Haematology.....	10	185	195
Medicine.....	1155	2740	3895
Neurology.....	149	484	633
Obstetrics.....	1839	12,997	14,836
Oncology.....	187	1248	1435
Oral Surgery.....	346	391	737
Orthopaedics.....	960	1818	2778
Pediatrics.....	2100	6792	8892
Physiotherapy.....	188	1841	2029
Plastic Surgery.....	27	69	96
Proctology.....	116	150	266
Psychiatry.....	163	447	610
Surgery.....	2040	6331	8371
Tuberculosis.....	137	649	786
Total.....	17,755	61,660	79,415



## MERCY HOSPITAL

## BOARD OF GOVERNORS

★WALTER D. WISE, *Chairman*

SISTER M. VERONICA  
 SISTER M. CELESTE  
 SISTER M. HELEN  
 SISTER M. PHILIP  
 SISTER M. VINCENT  
 SISTER M. JOSEPH

HENRY F. BONGARDT  
 H. RAYMOND PETERS  
 ★MAURICE C. PINCOFFS  
 WAITMAN F. ZINN  
 THOMAS K. GALVIN  
 EDWARD P. SMITH  
 ELLIOTT H. HUTCHINS

## MERCY HOSPITAL STAFF

<i>Surgeon-in-Chief</i> .....	★WALTER D. WISE
<i>Acting Surgeon-in-Chief</i> .....	ELLIOTT H. HUTCHINS
<i>Surgeons</i> .....	{ CHARLES F. BLAKE F. L. JENNINGS R. W. LOCHER THOMAS R. CHAMBERS ELLIOTT H. HUTCHINS ★D. J. PESSAGNO WILLIAM F. RIENHOFF N. CLYDE MARVEL HENRY F. BONGARDT
<i>Associate Surgeons</i> .....	{ I. O. RIDGELY JAMES W. NELSON HOWARD B. McELWAIN ★SIMON H. BRAGER JOHN A. O'CONNOR THOMAS B. AYCOCK CHARLES W. MAXSON ★I. RIDGEWAY TRIMBLE ★RICHARD T. SHACKELFORD RAYMOND F. HELFRICH
<i>Assistant Surgeons</i> .....	{ ★JULIUS GOODMAN E. EUGENE COVINGTON ★S. DEMARCO, JR. T. J. TOUHEY WILLIAM N. McFAUL, JR. ★MEYER H. ZURAVIN ★HOWARD L. ZUPNIK ★DANIEL R. ROBINSON ★JOSEPH V. JERARDI WM. C. DUNNIGAN HAROLD H. BURNS ★†F. FORD LOKER
<i>Consulting Ophthalmologist and Otologist</i> .....	HARRY FRIEDENWALD

<i>Ophthalmologists and Otologists</i> .....	{ H. K. FLECK M. RASKIN
<i>Associate Ophthalmologists and Otologists</i> .....	{ JOSEPH I. KEMLER F. A. PACIENZA
<i>Assistant Ophthalmologist and Otologist</i> .....	*JOSEPH V. JEPPI
<i>Consulting Rhinologists and Laryngologists</i> .....	{ W. RAYMOND MCKENZIE GEORGE W. MITCHELL
<i>Rhinologist and Laryngologist</i> .....	WAITMAN F. ZINN
<i>Associate Rhinologists and Laryngologists</i> .....	{ F. A. KAYSER BENJAMIN S. RICH *THEODORE A. SCHWARTZ *BIRKHEAD MACGOWAN
<i>Assistant Rhinologist and Laryngologist</i> .....	*JOSEPH V. JEPPI
<i>Bronchoscopist</i> .....	WAITMAN F. ZINN
<i>Associate Bronchoscopist</i> .....	F. A. KAYSER
<i>Assistant Bronchoscopist</i> .....	*THEODORE A. SCHWARTZ
<i>Proctologist</i> .....	CHARLES F. BLAKE
<i>Assistant Proctologist</i> .....	E. EUGENE COVINGTON
<i>Orthopaedic Surgeon</i> .....	ALBERTUS COTTON
<i>Associate Orthopaedic Surgeon</i> .....	H. L. ROGERS
<i>Assistant Orthopaedic Surgeons</i> .....	{ I. H. MASERITZ *J. H. GASKELL
<i>Urologist</i> .....	KENNETH D. LEGGE
<i>Associate Urologists</i> .....	{ LEON K. FARGO FRANCIS W. GILLIS
<i>Dermatologists</i> .....	{ FRANCIS A. ELLIS *WILLIAM D. WOLFE
<i>Dentist</i> .....	*J. D. FUSCO
<i>Assistant Dentists</i> .....	{ J. J. FOLEY *B. WALLACE INMAN STUART BUPPERT
<i>Consulting Physician</i> .....	*MAURICE C. PINCOFFS
<i>Physician-in-Chief</i> .....	H. RAYMOND PETERS
<i>Physicians</i> .....	{ HARVEY G. BECK THOMAS P. SPRUNT GEORGE MCLEAN J. SHELDON EASTLAND *LOUIS A. M. KRAUSE

<i>Associate Physicians</i> .....	{	HUBERT C. KNAPP
	{	BARTUS T. BAGGOTT
	{	THOMAS C. WOLFF
	{	WETHERBEE FORT
	{	JOHN E. LEGGE
<i>Assistant Physicians</i> .....	{	T. NELSON CAREY
	{	SOL SMITH
	{	†HUGH J. WELCH
	{	S. A. TUMMINELLO
	{	J. HOWARD BURNS
<i>Associate Gastro-Enterologists</i> .....	{	EARL L. CHAMBERS
	{	K. W. GOLLEY
	{	*WILLIAM H. KAMMER, JR.
	{	*DONALD J. ROOP
	{	*S. EDWIN MULLER
<i>Assistant Gastro-Enterologists</i> .....	{	*†WILLIAM C. LOWE
	{	T. FREDERICK LEITZ
	{	THEODORE H. MORRISON
	{	MAURICE FELDMAN
	{	†JOSEPH SINDLER
<i>Pediatricians</i> .....	{	EDGAR B. FRIEDENWALD
	{	FREDERICK B. SMITH
	{	G. BOWERS MANSDORFER
	{	WILLIAM J. SCHMITZ
	{	WILLIAM M. SEABOLD
<i>Associate Pediatrician</i> .....	{	*JEROME FINEMAN
	{	ANDREW C. GILLIS
	{	*HARRY GOLDSMITH
	{	PHILIP F. LERNER
	{	EDWARD P. SMITH
<i>Neurologist and Psychiatrist</i> .....	{	ERNEST S. EDLOW
	{	WILLIAM S. GARDNER
	{	THOMAS K. GALVIN
	{	*FRANK K. MORRIS
	{	†J. J. ERWIN
<i>Obstetrician-in-Chief</i> .....	{	CHARLES H. DOELLER, JR.
	{	ERNEST S. EDLOW
	{	WILLIAM S. GARDNER
	{	THOMAS K. GALVIN
	{	*FRANK K. MORRIS
<i>Obstetricians</i> .....	{	†J. J. ERWIN
	{	CHARLES H. DOELLER, JR.
	{	ERNEST S. EDLOW
	{	WILLIAM S. GARDNER
	{	THOMAS K. GALVIN
<i>Associate Obstetrician</i> .....	{	J. HOWARD BURNS
	{	†WILLIAM C. DUFFY
	{	WILLIAM S. GARDNER
	{	THOMAS K. GALVIN
	{	EDWARD P. SMITH
<i>Assistant Obstetricians</i> .....	{	GEORGE A. STRAUSS, JR.
	{	J. J. ERWIN
	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS
	{	WILLIAM S. GARDNER
<i>Consulting Gynecologist</i> .....	{	THOMAS K. GALVIN
	{	EDWARD P. SMITH
	{	GEORGE A. STRAUSS, JR.
	{	J. J. ERWIN
	{	ERNEST S. EDLOW
<i>Gynecologist-in-Chief</i> .....	{	*FRANK K. MORRIS
	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS
	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS
<i>Gynecologists</i> .....	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS
	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS
	{	ERNEST S. EDLOW
<i>Associate Gynecologists</i> .....	{	*FRANK K. MORRIS
	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS
	{	ERNEST S. EDLOW
	{	*FRANK K. MORRIS



<i>Assistant Gynecologists</i> .....	{ ★HARRY L. GRANOFF CHARLES H. DOELLER, JR. †WILLIAM C. DUFFY †WILLIAM J. RYSANEK, JR.
<i>Pathologists</i> .....	{ ★WALTER C. MERKEL HUGH R. SPENCER C. GARDNER WARNER
<i>Clinical Pathologists</i> .....	{ H. T. COLLENBERG H. RAYMOND PETERS CHARLES E. BRAMBLE
<i>Technicians</i> .....	{ SISTER PAULA MARIE ELEANOR BEHR RUTH FUGMAN EDITH BENSON ELIZABETH JOHNSON MIRIAM WALSH LILLIAN LAWLER
<i>Radiographer</i> .....	ALBERTUS COTTON
<i>Associate Radiographer</i> .....	HARRY L. ROGERS
<i>Assistant Radiographers</i> .....	{ ★A. D. YOUNG WILLIAM GREENFELD
<i>Technicians</i> .....	{ SISTER M. KEVIN CHARLOTTE CLOPTER HENRIETTA McCAFFERY

## ANNUAL HOSPITAL APPOINTMENTS

The following annual appointments are made to the Mercy Hospital:

Five Residents in Surgery	Resident in Rhinology
Three Residents in Medicine	Two Residents in Gynecology
Twelve Interns on Rotating Service	

## MERCY HOSPITAL RESIDENT AND INTERN STAFF

JANUARY 1, 1944 - SEPTEMBER 30, 1944

### RESIDENT STAFF

J. LAWRENCE GILLESPIE, B.S., M.D., *Resident Surgeon*.  
 PATRICK C. PHELAN, JR., A.B., M.D., *Associate Resident Surgeon*.  
 ROBERT Z. BERRY, A.B., M.D., *Assistant Resident Surgeon*.  
 DAVID B. GRAY, B.S., M.D., *Assistant Resident Surgeon*.  
 JOHN R. DAVIS, JR., A.B., M.D., *Resident Physician*.  
 J. EMMETT QUEEN, A.B., M.D., *Assistant Resident Physician*.  
 J. CARLTON WICH, B.S., M.D., *Assistant Resident Physician*.  
 JOSEPH C. SHEEHAN, B.S., M.D., *Resident Gynecologist*.  
 NICHOLAS DESIMONE, B.S., M.D., *Resident Obstetrician*.  
 TONEY R. GIGLIA, B.S., M.D., *Assistant Resident in Gynecology and Obstetrics*.  
 ROBERT B. TUNNEY, A.B., M.D., *Assistant Resident in Gynecology and Obstetrics*.

### INTERNS

ELMER E. COOK, JR., B.S., M.D.	FRANCIS E. HORN BROOK, B.S., M.D.
ROBERT MACGONIGLE N. CROSBY, M.D.	ROBERT B. MCFADDEN, B.S., M.D.
M. JANE FOLEY, A.B., M.D.	JOHN C. OZAZEWSKI, B.S., M.D.
J. ROY GUYTHER, B.S., M.D.	PAUL R. ZIEGLER, B.S., M.D.

## ANNOUNCEMENT OF

## MERCY HOSPITAL RESIDENT AND INTERN STAFF

OCTOBER 1, 1944 - JUNE 30, 1945

### RESIDENT STAFF

PATRICK C. PHELAN, JR., A.B., M.D., *Resident Surgeon*.  
 ROBERT Z. BERRY, A.B., M.D., *Associate Resident Surgeon*.  
 ELMER E. COOK, JR., B.S., M.D., *Assistant Resident Surgeon*.  
 PAUL R. ZIEGLER, B.S., M.D., *Assistant Resident Surgeon*.  
 J. EMMETT QUEEN, A.B., M.D., *Resident Physician*.  
 J. ROY GUYTHER, A.B., M.D., *Assistant Resident Physician*.  
 M. JANE FOLEY, A.B., M.D., *Assistant Resident Physician*.  
 TONEY R. GIGLIA, B.S., M.D., *Resident Gynecologist*.  
 ROBERT B. TUNNEY, A.B., M.D., *Resident Obstetrician*.  
 FRANCIS E. HORN BROOK, B.S., M.D., *Assistant Resident in Gynecology and Obstetrics*.

INTERNS

HOUSTON L. BELL, B.S., M.D.  
 CHARLES F. HOBELMANN, A.B., M.D.  
 CHARLES F. O'DONNELL, M.D.  
 WILLIAM W. OSBORNE, M.D.  
 JOHN M. PALESE, B.S., M.D.  
 CARL N. PATTERSON, B.S., M.D.

EDWIN L. PIERPONT, B.S., M.D.  
 HARRY F. ROLFES, B.S., M.D.  
 WALTER K. SPELSBURG, B.S., M.D.  
 FRANCIS X. P. TINKER, B.S., M.D.  
 ROY B. TURNER, JR., B.S., M.D.  
 JOHN F. ULLSPERGER, A.B., M.D.

MERCY HOSPITAL DISPENSARY STAFF

<i>Supervisor of Surgical Clinic</i> .....	RAYMOND F. HELFRICH
<i>Assistant Supervisor of Surgical Clinic</i> .....	HAROLD H. BURNS
	{ I. O. RIDGELY
	{ H. F. BONGARDT
	{ JAMES W. NELSON
	{ *I. RIDGEWAY TRIMBLE
	{ *SIMON H. BRAGER
	{ *S. DEMARCO, JR.
<i>Assistant Surgeons</i> .....	{ E. EUGENE COVINGTON
	{ *RICHARD T. SHACKELFORD
	{ *MEYER H. ZURAVIN
	{ *HOWARD L. ZUPNIK
	{ *DANIEL R. ROBINSON
	{ *JOSEPH V. JERARDI
	{ *RAYMOND J. LIPIN
	{ *WILLIAM M. GARLICK
<i>Supervisor of Genito-Urinary Clinic</i> .....	KENNETH D. LEGGE
<i>Assistant Genito-Urinary Surgeons</i> .....	{ L. K. FARGO
	{ FRANCIS W. GILLIS
<i>Orthopaedic Surgeons</i> .....	{ ALBERTUS COTTON
	{ HARRY L. ROGERS
	{ I. H. MASERITZ
	{ JASON H. GASKELL
<i>Supervisors of Medical Clinic</i> .....	{ H. RAYMOND PETERS
	{ *MAURICE C. PINCOFFS
<i>Chief of Medical Clinic</i> .....	SOL SMITH
	{ *MILTON STEIN
	{ LOUIS F. KLIMES
	{ *IRVING FREEMAN
<i>Assistant Physicians</i> .....	{ NATHANIEL M. BECK
	{ *S. EDWIN MULLER
	{ *†WILLIAM C. LOWE
	{ †JOHN R. DAVIS
<i>Chief of Cardiovascular Clinic</i> .....	THOMAS C. WOLFF
<i>Assistant Cardiologist</i> .....	LEON ASHMAN
<i>Chief of Metabolism Clinic</i> .....	J. SHELDON EASTLAND

<i>Assistant in Metabolism Clinic</i> .....	LOUIS F. KLIMES
<i>Gastro-Enterologist</i> .....	MAURICE FELDMAN
<i>Chief of Pediatric Clinic</i> .....	EDGAR B. FRIEDENWALD
<i>Pediatricians</i> .....	{ G. BOWERS MANSDORFER ★JEROME FINEMAN GEORGE BAYLEY †JOHN W. MACHEN
<i>Supervisor of Neurological and Psychiatric Clinic</i> .....	ANDREW C. GILLIS
<i>Neurologists and Psychiatrists</i> .....	{ ★HARRY GOLDSMITH PHILIP F. LERNER †JOHN W. MACHEN GEORGE C. MEDAIREY
<i>Supervisor of Dermatology Clinic</i> .....	FRANCIS A. ELLIS
<i>Dermatologist</i> .....	★WILLIAM D. WOLFE
<i>Oncologist</i> .....	JAMES W. NELSON
<i>Chief of Gynecology Clinic</i> .....	THOMAS K. GALVIN
<i>Gynecologists</i> .....	{ EDWARD P. SMITH ERNEST S. EDLOW ★H. L. GRANOFF J. J. ERWIN ★FRANK K. MORRIS GEORGE A. STRAUSS, JR. CHARLES H. DOELLER, JR. †WILLIAM C. DUFFY †WILLIAM J. RYSANEK, JR.
<i>Chief of Obstetrical Clinic</i> .....	EDWARD P. SMITH
<i>Obstetricians</i> .....	{ ★WILLIAM A. DODD ★HARRY McBRINE BECK CHARLES H. DOELLER, JR. J. HOWARD BURNS WILLIAM C. DUFFY
<i>Esophagoscopist</i> .....	WAITMAN F. ZINN
<i>Rhinologists and Laryngologists</i> .....	{ WAITMAN F. ZINN BENJAMIN S. RICH ★THEODORE A. SCHWARTZ SAMUEL L. FOX †ALBERT A. MAYBENO
<i>Ophthalmologists and Otologists</i> .....	{ M. RASKIN F. A. PACIENZA ★JOSEPH V. JEPPI F. EDWIN KNOWLES, JR.
<i>Supervisor of Proctology Clinic</i> .....	CHARLES F. BLAKE
<i>Proctologists</i> .....	{ E. EUGENE COVINGTON ★SIMON H. BRAGER



<i>Supervisor of Dental Clinic</i> .....	CONRAD L. INMAN
<i>Dentists</i> .....	{ *J. D. FUSCO *B. WALLACE INMAN STUART BUPPERT
<i>Supervisor of Physiotherapy Clinic</i> .....	LEON HANNAN
<i>Assistant Physiotherapist</i> .....	ALICE R. HANNAN
<i>Social Worker</i> .....	MARGARET TRAVERS
<i>Secretaries</i> .....	{ ELEANOR ARNICK EVA APPLGARTH

## MERCY HOSPITAL DISPENSARY REPORT

Year of 1943

<i>Department</i>	<i>New Cases</i>	<i>Old Cases</i>	<i>Total</i>
Bronchoscopic.....	230	685	915
Cardiology.....	6	240	246
Dental.....	37	37	74
Dermatology.....	122	365	487
Diabetic.....	11	281	292
Gastro-Intestinal.....	9	140	149
Genito-Urinary.....	98	1,062	1,160
Gynecology.....	219	829	1,048
Medicine.....	440	2,168	2,608
Neurology.....	40	472	512
Ophthalmology.....	79	415	494
Orthopaedics.....	60	448	508
Pediatrics.....	254	944	1,198
Physiotherapy.....	83	1,276	1,359
Postnatal.....	184	208	392
Prenatal.....	358	2,151	2,509
Proctology.....	1	7	8
Rhinolaryngology.....	270	609	879
Surgery.....	614	2,403	3,017
Surgical Follow-Up.....	106	499	605
Well Baby Clinic.....	36	30	66
Totals.....	3,257	15,269	18,526

## THE BALTIMORE CITY HOSPITALS

STAFF, 1944-1945

PARKER J. McMILLIN, *Superintendent*

<i>Consulting Chief Surgeon</i> .....	ARTHUR M. SHIPLEY, M.D., D.Sc.
<i>Surgeon-in-Chief</i> .....	THOMAS B. AYCOCK, B.S., M.D.
<i>Physician-in-Chief</i> .....	★JOHN T. KING, JR., A.B., M.D.
<i>Physician-in-Chief</i> .....	C. HOLMES BOYD, M.D.
<i>Physician-in-Chief, X-ray</i> .....	HOWARD H. ASHBURY, M.D.
<i>Physician-in-Chief, Tuberculosis Hospital</i> .....	LAWRENCE M. SERRA, M.D.
<i>Physician-in-Chief, Psychopathic Hospital</i> .....	ESTHER L. RICHARDS, M.D.
<i>Obstetrician-in-Chief</i> .....	LOUIS H. DOUGLASS, M.D.
<i>Pediatrician-in-Chief</i> .....	★T. CAMPBELL GOODWIN, A.B., M.D.
<i>Pediatrician-in-Chief</i> .....	†HUGH W. JOSEPHS, M.D.
<i>Pathologist-in-Chief</i> .....	FRANK B. KINDELL, A.B., M.D.
<i>Dental Surgeon-in-Chief</i> .....	LOWELL P. HENNEBERGER, D.D.S.
<i>Assistant Surgeon-in-Chief</i> .....	OTTO C. BRANTIGAN, M.D.
<i>Visiting Surgeons</i> .....	{ ★HARRY C. HULL, M.D. SAMUEL McLANAHAN, JR., A.B., M.D. THURSTON R. ADAMS, M.D.
<i>Consultant in Traumatic Surgery</i> .....	CHARLES A. REIFSCHNEIDER, M.D.
<i>Consultants in General Surgery</i> .....	{ F. C. LEE, M.D. ★I. RIDGEWAY TRIMBLE, M.D.
<i>Consultant in Peripheral Vascular Diseases</i> .....	★GEORGE H. YEAGER, B.S., M.D.
<i>Consultants in Plastic Surgery</i> .....	{ EDWARD A. KITLOWSKI, M.D. EDWARD M. HANRAHAN, JR., M.D. LUTHER E. LITTLE, M.D.
<i>Assistant Visiting Surgeons</i> .....	{ EDGAR J. POTH, M.D. PHILIP B. PRICE, M.D. HARRIS B. SHUMACKER, M.D.
<i>Assistant Visiting Physician, Tuberculosis</i> .....	WILLIAM H. GRENZER, M.D.
<i>Assistant Visiting Psychiatrist</i> .....	THOMAS A. C. RENNIE, M.D.
<i>Visiting Obstetrician</i> .....	J. MORRIS REESE, M.D.
<i>Assistant Visiting Obstetricians</i> .....	{ JOHN M. HAWS, B.S., M.D. MARIUS P. JOHNSON, A.B., M.D. ★JOHN E. SAVAGE, B.S., M.D. HUGH B. McNALLY, B.S., M.D. ★WILLIAM DORMAN, M.D.
<i>Visiting Pediatricians</i> .....	{ ★WILLIAM B. STIFLER, M.D. ★B. MATTHEW DEBUSKEY, M.D.
<i>Assistant Visiting Pediatrician</i> .....	WILLIAM M. SEABOLD, A.B., M.D.
<i>Visiting Gynecologist</i> .....	J. MASON HUNDLEY, JR., M.A., M.D.
<i>Assistant Visiting Gynecologists</i> .....	{ BEVERLEY COMPTON, M.D. JOHN C. DUMLER, B.S., M.D. JOHN T. HIBBITTS, M.D. ★ERNEST I. CORNBROOKS, JR., M.D. WILLIAM B. SETTLE, M.D. WILLIAM K. DIEHL, M.D.

<i>Assistant Chief Physician</i> .....	HOWARD K. RATHBUN, M.D.
<i>Visiting Physicians</i> .....	{★JOHN W. PARSONS, M.D. ★LOUIS A. M. KRAUSE, M.D. HARRY F. KLINEFELTER, JR., M.D.
<i>Assistant Visiting Physician</i> .....	THURSTON HARRISON, M.D.
<i>Visiting Cardiologist</i> .....	★RAYMOND HUSSEY, M.A., M.D.
<i>Visiting Ophthalmologist</i> .....	FRANK B. WALSH, M.D.
<i>Visiting Orthopaedic Surgeon</i> .....	ALLEN FISKE VOSHELL, A.B., M.D.
<i>Assistant Visiting Orthopaedic Surgeon</i> .....	★HENRY F. ULLRICH, M.D., D.Sc.
<i>Visiting Laryngologists</i> .....	{THOMAS R. O'ROURK, M.D. ★JOHN BORDLEY, M.D.
<i>Assistant Visiting Laryngologist</i> .....	DONALD F. PROCTOR, M.D.
<i>Visiting Urologist</i> .....	W. HOUSTON TOULSON, M.Sc., M.D.
<i>Assistant Visiting Urologists</i> .....	{★HUGH JEWETT, M.D. ★HOWARD B. MAYS, M.D.
<i>Visiting Neurological Surgeon</i> .....	CHARLES BAGLEY, JR., M.A., M.D.
<i>Assistant Visiting Neurological Surgeons</i> .....	{RICHARD G. COBLENTZ, M.A., M.D. JAMES G. ARNOLD, JR., M.D.
<i>Visiting Neurologists</i> .....	{FRANK R. FORD, M.D. O. R. LANGWORTHY, M.D.
<i>Assistant Visiting Neurologists</i> .....	{★HARRY A. TEITELBAUM, M.D. LUIS ORTEGA, M.D.
<i>Visiting Proctologist</i> .....	★MONTE EDWARDS, M.D.
<i>Visiting Oncologists</i> .....	{GRANT E. WARD, A.B., M.D. ★MURRAY M. COPELAND, M.D.
<i>Assistant Visiting Otologist</i> .....	J. J. BELEMER, M.D.
<i>Visiting Dermatologist</i> .....	ISAAC R. PELS, M.D.
<i>Visiting Dental Surgeon</i> .....	H. GLENN WARING, D.D.S.
<i>Assistant Visiting Dental Surgeons</i> .....	{L. W. BIMESTEFER, D.D.S. ★JOSEPH B. BERKE, D.D.S. ★B. W. MIKSINSKI, D.D.S.

THE JAMES LAWRENCE KERNAN HOSPITAL AND  
INDUSTRIAL SCHOOL OF MARYLAND FOR  
CRIPPLED CHILDREN

STAFF, 1944-1945

<i>Surgeon-in-Chief and Medical Director</i> .....	ALLEN FISKE VOSHELL, A.B., M.D.
<i>Attending Orthopaedic Surgeon and Roentgenologist</i> .....	ALBERTUS COTTON, A.M., M.D.
<i>Associate Orthopaedic Surgeons</i> .....	{ MOSES GELLMAN, B.S., M.D. HARRY ROGERS, M.D. WINTHROP M. PHELPS, A.B., M.D.
<i>Assistant Orthopaedic Surgeon</i> .....	† MILTON J. WILDER, M.D.
<i>Plastic Surgeon</i> .....	EDWARD A. KITLOWSKI, A.B., M.D.
<i>Aurist and Laryngologist</i> .....	BENJAMIN S. RICH, A.B., M.D.
<i>Dentist</i> .....	M. E. COBERTH, D.D.S.
<i>Pediatrist</i> .....	HELEN M. TAUSSIG, M.D.
<i>Consulting Surgeons</i> .....	{ ARTHUR M. SHIPLEY, M.D., Sc.D. CHARLES REID EDWARDS, A.B., M.D. THOMAS B. AYCOCK, B.S., M.D.
<i>Consulting Aurist and Laryngologist</i> .....	{ FRANKLIN B. ANDERSON, M.D. EDWARD A. LOOPER, M.D., D.Oph.
<i>Consulting Neurological Surgeon</i> .....	CHARLES BAGLEY, JR., M.A., M.D.
<i>Consulting Plastic Surgeon</i> .....	JOHN STAIGE DAVIS, B.Sc., M.D.
<i>Consulting Physician</i> .....	THOMAS R. BROWN, A.B., M.D.
<i>Consulting Dermatologists</i> .....	{ HARRY M. ROBINSON, Sr., M.D. LEON GINSBERG, M.D.
<i>Consulting Neurologists</i> .....	{ IRVING J. SPEAR, M.D. R. V. SELIGER, M.D.
<i>Consulting Pediatrist</i> .....	BENJAMIN TAPPAN, A.B., M.D.
<i>Consulting Dentist</i> .....	HARRY B. MCCARTHY, D.D.S.
<i>Consulting Ophthalmologists</i> .....	{ HARRY FRIEDENWALD, A.B., M.D., D.H.L., D.Sc. WILLIAM TARUN, M.D.
<i>Consulting Pathologist</i> .....	HUGH R. SPENCER, M.D.
<i>Consulting Roentgenologist</i> .....	HENRY J. WALTON, M.D.
<i>Resident Orthopaedic Surgeons</i> .....	{ † CHARLES J. BASILE, M.D. † WM. L. WALDROP, M.D. † GEORGE S. APPLEBY, M.D.
<i>Superintendent</i> .....	MISS MAUD M. GARDNER, R.N.
<i>Dispensary and Social Service Nurse</i> .....	MRS. EVELYN BYRD ZAPP, R.N.
<i>Physical Therapists and X-ray Technician</i> .....	{ ★ MISS JANE EWING, P.T., Reg. MRS. GEORGIANA WISONG
<i>Occupational Therapist</i> .....	MISS MURIEL ZIMMERMAN, O.T.
<i>Instructor in Grammar School</i> .....	MRS. LAURA SIEMON



## HISTORY OF THE SCHOOL OF MEDICINE

The present School of Medicine, with the title University of Maryland School of Medicine and College of Physicians and Surgeons, is the result of a consolidation and merger of the University of Maryland School of Medicine with the Baltimore Medical College (1913) and the College of Physicians and Surgeons of Baltimore (1915).

Through the merger with the Baltimore Medical College, an institution of thirty-two years' growth, the facilities of the School of Medicine were enlarged in faculty, equipment and hospital connection.

The College of Physicians and Surgeons was incorporated in 1872, and established on Hanover Street in a building afterward known as the *Maternité*, the first obstetrical hospital in Maryland. In 1878 union was effected with the Washington University School of Medicine, in existence since 1827, and the college was removed to Calvert and Saratoga Streets. Through the consolidation with the College of Physicians and Surgeons, medical control of the teaching beds in the Mercy Hospital was obtained.

The School of Medicine of the University of Maryland is one of the oldest foundations for medical education in America, ranking fifth in point of age among the medical colleges of the United States. It was organized in 1807, and chartered in 1808, under the name of the College of Medicine of Maryland, and its first class was graduated in 1810. In 1812 the College was empowered by the Legislature to annex three other colleges or faculties: Divinity, Law, and Arts and Sciences; and the four colleges thus united were "constituted an University by the name and under the title of the University of Maryland."

The original building of the Medical School at the N. E. corner of Lombard and Greene Streets, was erected in 1812. It is the oldest structure in this country from which the degree of doctor of medicine has been granted annually since its erection. In this building were founded one of the first medical libraries and one of the first medical school libraries in the United States.

At this Medical School dissection was made a compulsory part of the curriculum, and independent chairs for the teaching of gynecology and pediatrics (1867), and of ophthalmology and otology (1873), were installed for the first time in America.

This School of Medicine was one of the first to provide for adequate clinical instruction by the erection of its own hospital in 1823. In this hospital intramural residency for senior students was established for the first time.

### BUILDINGS AND FACILITIES

The original medical building at the N. E. corner of Lombard and Greene Streets houses the Office of the Dean, Office of the Assistant Dean and two lecture halls.

The Administration Building, to the east of the original building, contains the Baltimore offices of the Registrar and the Director of Admissions and two lecture halls.

The laboratory building at 31 South Greene Street is occupied by the departments of Pathology, Bacteriology and Biochemistry.

The Frank C. Bressler Research Laboratory provides the departments of Anatomy, Histology and Embryology, Pharmacology, Physiology and Clinical Pathology with facilities for teaching and research. It also houses the research laboratories of the clinical departments, animal quarters, a laboratory for teaching Operative Surgery, a lecture hall and the Bressler Memorial Room.

This building was erected in 1939-1940 at 29 South Greene Street opposite the University Hospital. It was built with funds left to the School of Medicine by the late Frank C. Bressler, an alumnus, supplemented by a grant from the Federal government. The structure, in the shape of an I, extends east from Greene Street, just north of the original building.

#### MEDICAL LIBRARY

CARL W. HINTZ, A.B., A.B.L.S., A.M.L.S. .... *Director of Libraries*

§THELMA R. WILES, A.B., A.B.L.S. .... *Librarian*

RUTH LEE BRISCOE. .... *Assistant Librarian*

JULIA E. WILSON, B.S., B.S.L.S. .... *Assistant Librarian*

EDITH R. MCINTOSH, A.B., A.B.L.S. .... *Cataloguer*

MARY SCARPULLA. .... *Assistant to the Cataloguer*

The Medical Library of the University of Maryland, founded in 1813 by the purchase of the collection of Dr. John Crawford, now numbers 23,000 volumes and several thousand pamphlets and reprints. Over three hundred of the leading medical journals, both foreign and domestic, are received regularly. The library is housed in Davidge Hall, a comfortable and commodious building in close proximity to classrooms and laboratories, and is open daily for the use of members of the faculty, the student body and the profession generally. Libraries pertaining to particular phases of medicine are maintained by several departments of the medical school.

The library of the Medical and Chirurgical Faculty of Maryland and the Welch Medical Library are open to students of the medical school without charge. Other libraries of Baltimore are the Peabody Library and the Enoch Pratt Free Library.

#### DISPENSARY BUILDING

The old hospital building has been remodeled and is occupied by the Out-patient Department. Thus the students have been provided with a splendidly appointed group of clinics for their training in out-patient work. All departments of clinical training are represented in this remodeled building and all changes have been predicated on the teaching function for which this department is intended.

The office of the Medical School Physician is located in this building.

The Department of Art also occupies quarters here.

#### UNIVERSITY HOSPITAL

The University Hospital, which is the property of the University of Maryland, is the oldest institution for the care of the sick in the state of Maryland. It was

§ Died, July 4, 1944.

opened in September 1823, under the name of the Baltimore Infirmary, and at that time consisted of but four wards, one of which was reserved for patients with diseases of the eye.

In 1933-1934 the new University Hospital was erected, and patients were admitted to this building in November 1934. The new hospital is situated at the southwest corner of Redwood and Greene Streets, and is consequently opposite the medical school buildings. The students, therefore, are in close proximity and little time is lost in passing from the lecture halls and laboratories to the clinical facilities of the new building.

This new building, with its modern planning, makes a particularly attractive teaching hospital and is a very valuable addition to the clinical facilities of the medical school.

The new hospital has a capacity of 435 beds and 65 bassinets devoted to general medicine, surgery, obstetrics, pediatrics, and the various medical and surgical specialties.

The teaching zone extends from the second to the eighth floor and comprises wards for surgery, medicine, obstetrics, pediatrics, and a large clinical lecture hall. There are approximately 270 beds available for teaching.

The space of the whole north wing of the second floor is occupied by the Department of Roentgenology. The east wing houses clinical pathology and special laboratories for clinical microscopy, biochemistry, bacteriology, and an especially well appointed laboratory for students' training. The south wing provides space for electro-cardiographic and basal metabolism departments, with new and very attractive air-conditioned or oxygen therapy cubicles. The west wing contains the Departments of Rhinology and Bronchoscopy, Industrial Surgery, Ophthalmology, and Male and Female Cystoscopy.

The third and fourth floors each provide two medical and two surgical wards. The fifth floor contains two wards for pediatrics, and on the sixth floor there are two wards for obstetrics. Each ward occupies the space of one wing of the hospital.

On the seventh floor is the general operating suite, the delivery suite, and the central supply station. The eighth floor is essentially a students' floor and affords a mezzanine over the operating and delivery suites, and a students' entrance to the clinical lecture hall.

In the basement there is a very well appointed Pathological Department with a large teaching autopsy room and its adjunct service of instruction of students in pathological anatomy.

The hospital receives a large number of accident patients because of its proximity to the largest manufacturing and shipping districts of the city.

The obstetrical service is particularly well arranged and provides accommodation for forty ward patients. This service, combined with an extensive home service, assures the student abundant obstetrical training.

During the year ending December 31, 1943, 1734 cases were delivered in the hospital and 1257 cases in the outdoor department. Students in the graduating class observed at least thirty-five cases, each student being required to deliver at least ten patients in their homes.

The dispensaries associated with the University Hospital and the Mercy Hospi-

tal are organized upon a uniform plan in order that the teaching may be the same in each. Each dispensary has the following departments: Medicine, Surgery, Pediatrics, Ophthalmology, Otology, Genito-Urinary, Gynecology, Gastro-Enterology, Neurology, Orthopaedics, Proctology, Dermatology, Laryngology, Rhinology, Cardiology, Tuberculosis, Psychiatry, Oral Surgery and Oncology.

All students in their junior year work each day during one-third of the year in the Departments of Medicine and Surgery of the dispensaries. In their senior year, all students work one hour each day in the special departments.

#### MERCY HOSPITAL

The Sisters of Mercy first assumed charge of the Hospital at the corner of Calvert and Saratoga Streets, then owned by the Washington University, in 1874. By the merger of 1878 the Hospital came under the control of the College of Physicians and Surgeons, but the Sisters continued their work of ministering to the patients.

In a very few years it became apparent that the City Hospital, as it was then called, was much too small to accommodate the rapidly growing demands upon it. However, it was not until 1888 that the Sisters of Mercy, with the assistance of the Faculty of the College of Physicians and Surgeons, were able to lay the cornerstone of the present hospital. This building was completed and occupied late in 1889. Since then the growing demands for more space have compelled the erection of additions, until now there are accommodations for 348 patients.

In 1909 the name was changed from The Baltimore City Hospital to Mercy Hospital.

The clinical material in the free wards is under the exclusive control of the Faculty of the University of Maryland School of Medicine and College of Physicians and Surgeons.

#### THE BALTIMORE CITY HOSPITALS

The clinical facilities of the School of Medicine have been largely increased by the liberal decision of the Department of Public Welfare to allow the use of the wards of these hospitals for medical education. The autopsy material also is available for student instruction.

Members of the junior class make daily visits to these hospitals for clinical instruction in medicine, surgery, and the specialties.

The Baltimore City Hospitals consist of the following separate divisions:

The General Hospital, 400 beds, 90 bassinets.

The Hospital for Chronic Cases, 575 beds.

The Hospital for Tuberculosis, 280 beds.

The Psychopathic Hospital, 85 beds.

Infirmery (Home for Aged) 1053 beds.

#### THE JAMES LAWRENCE KERNAN HOSPITAL AND INDUSTRIAL SCHOOL OF MARYLAND FOR CRIPPLED CHILDREN

This institution is situated on an estate of 75 acres at Dickeyville. The site is within the northwestern city limits and of easy access to the city proper.



The location is ideal for the treatment of children, in that it affords all the advantages of sunshine and country air.

A hospital unit, complete in every respect, offers all modern facilities for the care of any orthopaedic condition in children.

The hospital is equipped with 100 beds—endowed, and city and state supported.

The Orthopaedic Dispensary at the University Hospital is maintained in closest affiliation and cares for the cases discharged from the Kernan Hospital. The Physical Therapy Department is very well equipped with modern apparatus and trained personnel. Occupational therapy has been fully established and developed under trained technicians.

#### THE BALTIMORE EYE, EAR, AND THROAT HOSPITAL

This institution was first organized and operated in 1882 as an outgrowth of the Baltimore Eye and Ear Dispensary, which closed on June 14, 1882. The name then given to the new hospital was The Baltimore Eye and Ear Charity Hospital. It was located at the address now known as 625 W. Franklin St. The out-patient department was opened on September 18, 1882 and the hospital proper on November 1 of the same year. In 1898 a new building afforded 24 free beds and 8 private rooms; by 1907 the beds numbered 47; at present there are 60 beds, 29 of which are free. In 1922 the present hospital building at 1214 Eutaw Place was secured and in 1926 the dispensary was opened. In 1928 a clinical laboratory was installed. During 1943 the out-patient visits numbered 18,989.

Through the kindness of the Hospital Board and Staff, our junior students have access to the dispensary which they visit in small groups for instruction in ophthalmology.

## WARTIME REQUIREMENTS FOR ADMISSION

This school is cooperating with the Army Specialized Training Program and the Navy College Training Program.

### ANNOUNCEMENT OF TWO-YEAR ADMISSION REQUIREMENTS AND DATA ON ACCELERATED PROGRAM

The School of Medicine of the University of Maryland announced the adoption of minimum entrance requirements, in cooperation with the war effort, effective January 7, 1943, until further notice. These minimum requirements have superseded the standard requirements for the period of the emergency.

#### MINIMUM REQUIREMENTS FOR ADMISSION

The minimum admission requirements are two academic years (60 semester hours or 90 quarter hours) of credits, exclusive of physical education and military science, acquired at or acceptable to an approved college of arts and sciences. Included in these requirements are minimum credits in basic subjects which must be completed by every applicant before admission:

	<i>Semester hours</i>	<i>Quarter hours</i>
General biology or zoology.....	8	12
Inorganic chemistry.....	8	12
Organic chemistry.....	6	9
Physics.....	6 or 8*	9 or 12*
English.....	6	9
Modern language (Spanish, French, German, etc.).....	6	9
	<hr/> 40	<hr/> 60

(Minimum credit requirements are subject to adjustment to Army and Navy programs.)

In addition to these required subjects, electives should be chosen from courses in mathematics, English, psychology, history, sociology, political science, economics, philosophy. Supplemental courses may be taken in the basic sciences, for example, quantitative analysis in a 60 semester-hour program, and quantitative analysis and comparative vertebrate anatomy on a 90 semester-hour and degree basis.

#### APPLICATION FOR ADMISSION

Applications may be filed by civilians who will have completed at least the minimum requirements for admission 20 days before their entering classes begin. Decisions on admission will be made on applicants who are not subject to service with the Armed Forces. Applications may be filed by students who are subject to call by the Selective Service System, but no acceptance will be offered to members of this group unless or until a directive is published by the Selective Service System which will permit their appropriate deferment.

\* Whichever is a basic course in the college involved.

Application forms and catalogues may be secured from the Committee on Admissions, School of Medicine, University of Maryland, Baltimore-1, Maryland.

#### ENTERING DATES DURING ACCELERATION

During the period of acceleration classes will be admitted about every nine months.

	1944	1945	1946
Registration begins	Oct. 17	July 17	April 9
Classes begin	Oct. 19	July 19	April 11
Graduation	Sept. 29	June 22	March 22

#### LENGTH OF MEDICAL COURSE DURING ACCELERATION

The medical course consisting of four (4) full academic sessions of 32 weeks each will be completed in three (3) calendar years. Course content and length may be modified to meet wartime requirements.

#### GRADUATION DURING ACCELERATION

Graduation will take place about three years after the entering date.

#### TRANSFER STUDENTS FROM THE TWO-YEAR MEDICAL SCHOOLS

Applicants from the two-year medical schools will be considered at the end of their first year of medical study.

## STANDARD REQUIREMENTS FOR ADMISSION

## METHOD OF MAKING APPLICATION

Application forms may be filed one calendar year before the next incoming class. These forms may be secured from the Committee on Admissions, School of Medicine, University of Maryland, Baltimore-1, Maryland.

## APPLICATION FOR ADMISSION TO THE FIRST YEAR

Application for admission is made by filing the required form and by having all pertinent data sent directly to the Committee on Admissions, in accordance with the instructions accompanying the application.

## APPLICATION FOR ADMISSION TO ADVANCED STANDING

Students who have attended approved medical schools are eligible to file applications for admission to the second- and third-year classes. These applicants must be prepared to meet the current first-year entrance requirements in addition to presenting acceptable medical school credentials, and a medical school record based on courses which are quantitatively and qualitatively equivalent to similar courses in this school.

Application to advanced standing is made in accordance with the instructions accompanying the application form.

## MINIMUM REQUIREMENTS FOR ADMISSION

The minimum requirements for admission to the School of Medicine are:

- (a) Graduation from an approved secondary school, or the equivalent in entrance examinations, and
- (b) Three academic years of acceptable premedical credit earned in an approved college of arts and sciences. The quantity and quality of this preprofessional course of study shall be not less than that required for recommendation by the institution where the premedical courses are being, or have been, studied.

The premedical curriculum shall include basic courses in

English  
Biology  
Inorganic Chemistry  
Organic Chemistry  
Physics  
French or German



and such elective courses as will complete a balanced three-year schedule of study. The elective courses should be selected from the following three groups:

<i>Humanities</i>	<i>Natural Sciences</i>	<i>Social Sciences</i>
English (an advanced course in English composition should be taken, if possible)	Comparative Vertebrate Anatomy	Economics
Scientific German or French (A reading knowledge of either language is desirable, although German is preferred)	Embryology	History
Philosophy	Quantitative Analysis	Political Science
	Physical Chemistry	Psychology (a basic course is desirable)
	Mathematics	Sociology, etc.

Careful attention should be given to the selection of elective courses in the natural sciences. Accordingly, it is suggested that the elective list given above be a guide in this connection and that the remainder of the college credits be accumulated from courses designed to promote a broad cultural development. Students should avoid the inclusion of college courses in subjects that occur in the medical curriculum, for example, histology, histological technique, human anatomy, bacteriology, physiology, neurology, physiological chemistry.

It is not intended that these suggestions be interpreted to restrict the education of students who exhibit an aptitude for the natural sciences or to limit the development of students who plan to follow research work in the field of medicine.

In accepting candidates for admission, preference will be given to those applicants who have acceptable scholastic records in secondary school and college, satisfactory scores in the Medical Aptitude Test, favorable letters of recommendation from their premedical committees, or from one instructor in each of the departments of biology, chemistry, and physics, and who in all other respects give every promise of becoming successful students and physicians of high standing.

Those candidates for admission who are accepted will receive certificates of entrance from the Director of Admissions of the University.

This concludes the description of the standard requirements.

#### COMBINED COURSE IN ARTS AND SCIENCES AND MEDICINE

A combined seven years' curriculum leading to the degrees of Bachelor of Science and Doctor of Medicine is offered by the University of Maryland. The first three years are taken in residence in the College of Arts and Sciences at College Park, and the last four years in the School of Medicine in Baltimore. (See University catalogue for details of quantitative and qualitative premedical course requirements.)

Upon the completion of the first year in the School of Medicine with an average grade of "C" or better, and upon the recommendation of the Dean, the degree of Bachelor of Science may be conferred by the College of Arts and Sciences at the commencement following the *second year* of residence.

## STATE MEDICAL STUDENT QUALIFYING CERTIFICATES

Candidates for admission who live in or expect to practice medicine in Pennsylvania, New Jersey or New York, should apply to their respective state boards of education for medical student qualifying certificates (Pennsylvania and New Jersey) or approval of applications for medical student qualifying certificates (New York).

Those students who are accepted must file satisfactory State certificates in the office of the Committee on Admissions, School of Medicine, before registration. No exceptions will be made to this requirement.

*Addresses of the State Certifying Offices*

Director of Credentials Section, Pennsylvania Department of Public Instruction, Harrisburg, Pa.

Chief of the Bureau of Credentials, New Jersey Department of Public Instruction, Trenton, N. J.

Supervisor of Qualifying Certificates, The State Education Department, Examinations and Inspections Division, Albany, N. Y.

## DEFINITION OF RESIDENCE STATUS OF STUDENTS\*

Students who are minors are considered to be resident students if, at the time of their registration, the parents\* have been residents of this State for at least one year.

Adult students are considered to be resident students if, at the time of their registration, they have been residents of this State for at least one year, provided such residence has not been acquired while attending any school or college in Maryland.

The status of the residence of a student is determined at the time of his first registration in the university and may not thereafter be changed by him unless, in the case of a minor, his parents\* move to and become legal residents of this state by maintaining such residence for at least one full calendar year. However, the right of the student (minor) to change from a non-resident to a resident status must be established by him prior to registration for a semester in any academic year.

## CURRENT FEES

Matriculation fee (paid once).....	\$10.00
Tuition fee (each year)—Residents of Maryland.....	450.00
Tuition fee (each year)—Non-Residents.....	600.00
Laboratory fee (each year).....	25.00
Conditioned examination fee (each subject).....	5.00†
Student health service fee (each year).....	10.00
Student activities fee (each year).....	5.00†

\*The term "parents" includes persons who, by reason of death or other unusual circumstances, have been legally constituted the guardians of or stand in loco parentis to such minor students.

† These fees must be paid by students in the Army and Navy training programs. Other students must pay all fees.

Maintenance and service fee (each year) . . . Junior Class, \$7.00; others,	5.00
Graduation fee. . . . .	15.00†
Transcript fee to graduates. First copy gratis, each copy thereafter . .	1.00†

### RULES FOR PAYMENT OF FEES

No fees are returnable.

Make all checks or money orders payable to the University of Maryland.

When offering checks or money orders in payment of tuition and other fees, students are requested to have them drawn in the exact amount of such fees. Personal checks whose face value is in excess of the fees due will be accepted for collection only.

**Acceptance.**—Payment of the matriculation fee of \$10.00 and a deposit on tuition of \$50.00 is required of accepted applicants before the expiration date specified in the offer of acceptance. This \$60.00 deposit is not returnable and will be forfeited if the applicant fails to register, or it will be applied to the applicant's first semester's charges on registration.

**Registration.**—All students, after proper certification, are required to register at the Office of the Registrar. (See calendar in front of this bulletin for dates for the payments of fees, and the note regarding late registration fee.)

One-half of the tuition fee, the laboratory fee, the student health fee, the student activities fee, and the maintenance and service fee are payable on the date specified for registration for the first semester.

The remainder of the tuition fee shall be paid on the date of registration for the second semester. Fourth year students shall pay the graduation fee, in addition, at this registration.

### PENALTY FOR NON-PAYMENT OF FEES

If semester fees are not paid in full on the specified registration dates, a penalty of \$5.00 will be added.

If a satisfactory settlement, or an agreement for settlement, is not made with the Dean within ten days after a payment is due, the student automatically is debarred from attendance on classes and will forfeit the other privileges of the School of Medicine.

### REEXAMINATION FEE

A student who is eligible to reexaminations must notify the Dean two weeks in advance of his intention to take the examinations. He will pay the comptroller \$5.00 for each subject in which he is to be examined, and he must present the receipt to the faculty member giving the examination before he will be permitted to take the examination.

### MAINTENANCE AND SERVICE FEE

This fee pays for the maintenance of loan collections, provides photographs for departmental requests and state board applications, pays room-rent for the third- and fourth-year students when on outside obstetrics, and furnishes student invitations to the Pre-Commencement Exercises.

## PERSONAL EXPENSES

The following estimates of personal expenses for the academic year of eight months have been prepared by students, and are based upon actual experience. In addition to these the student must bear in mind the expenditure for a microscope.

	<i>Low</i>	<i>Average</i>	<i>Liberal</i>
Books.....	\$50	\$75	\$100
College incidentals.....	20	20	20
Board, eight months.....	224	288	352
Room rent.....	144	184	216
Clothing and laundry.....	50	80	150
All other expenses.....	25	50	75
Total.....	<u>\$513</u>	<u>\$697</u>	<u>\$913</u>

## STUDENT HEALTH SERVICE

T. NELSON CAREY, M.D.....Director, Student Health Service

The Medical School has made provision for the systematic care of students according to the following plan:

1. *Preliminary Examination*—All new students will be examined during the first week of the semester. Notice of the date, time, and place of the examination will be announced to the classes and on the bulletin board. The passing of this physical examination is necessary before final acceptance of any student.

2. *Medical Attention*—Students in need of medical attention will be seen by the school physician, Dr. T. N. Carey, in his office at the medical school, at 9 A.M. daily, except Saturday and Sunday. In case of necessity, students will be seen at their homes.

3. *Hospitalization*—If it becomes necessary for any student to enter the hospital during the school year, the school has arranged for the payment of part or all of his hospital expenses, depending on the length of his stay and special expenses incurred. This applies only to students admitted through the school physician's office.

4. *Physical Defects*—Prospective students are advised to have any known physical defects corrected before entering school in order to prevent loss of time which later correction might incur.

5. *Eye Examination*—Each new matriculate is required to undergo an eye examination at the hands of an oculist (Doctor of Medicine) within three months before entering the School of Medicine. Long study hours bring out unsuspected eye defects which cause much loss of time and inefficiency in study if not corrected until after school work is under way.

6. *Limitations*—It is not the function of this service to treat chronic conditions contracted by students before admission, nor to extend treatment to acute conditions arising in the period between academic years, unless the school physician recommends this service.



## GENERAL RULES

The right is reserved to make changes in the curriculum, the requirements for graduation, the fees and in any of the regulations whenever the university authorities deem it expedient.

## ADVANCEMENT AND GRADUATION

1. All students are required to take the spring examinations unless excused by the Dean.

2. When a student has failures in two completed major courses, he or she shall be dropped from the rolls of the Medical School.

3. No student will be permitted to pass to a higher class with conditions.

4. Should a student be required to repeat any year in the course, he must pay regular fees.

5. A student failing in final examinations for graduation at the end of the fourth year will be required to repeat the entire course of the fourth year and to take examinations in such other branches as may be required, should he again be permitted to enter the school as a candidate for graduation.

6. The general fitness of a candidate for graduation, as well as the results of his examinations, will be taken into consideration by the faculty.

## EQUIPMENT

7. At the beginning of the first year, all students must be prepared to purchase microscopes of a satisfactory type equipped with a mechanical stage and a sub-stage lamp.

A standard microscope of either Bausch & Lomb, Leitz, Spencer, or Zeiss make, fitted with the following attachments, will fill the requirements:

Oculars: 10 x and 5 x.

Triple nose piece with 16 mm., 4 mm., and 1.9 mm. 125 N.A. oil immersion lens.

Wide aperture stage with quick screw condenser.

All used microscopes are subject to inspection and approval before their use in the laboratory is permitted. The student is cautioned against the purchase of such an instrument before its official approval by the school.

8. Students in the second year class are required to provide stethoscopes.

9. Third- and fourth-year students are required to provide haemocytometers, ophthalmoscopes and otoscopes.

## STATE QUALIFYING CERTIFICATES

10. Candidates for admission who live in or expect to practice medicine in Pennsylvania, New Jersey or New York must file State certificates in the office of the Committee on Admissions, School of Medicine, before registration. No exception will be made to this rule.

## EYE EXAMINATION BEFORE ADMISSION

11. Each new matriculate in each class is required to present to the Committee on Admissions a certificate from an oculist, (a graduate in medicine) that the matriculate's eyes have been examined and are in condition, with or without glasses as the case may be, to endure the strain of close and intensive reading.

It is required that this examination be completed within three months prior to registration and that the certificate be mailed to the Committee on Admissions not later than one month before registration.

## AWARDING OF COMBINED DEGREES

12. Students entering the School of Medicine on a three-year requirement basis from colleges which usually grant a degree on the successful completion of the first year of medicine, are restricted by the following rule:

Upon completion of the first year in the School of Medicine with an average grade of "C" or better, and upon recommendation of the Dean of the School of Medicine, the degree of Bachelor of Science may be conferred by a College of Arts and Sciences following the student's *second year* of residence in the School of Medicine.

## COST OF TRANSCRIPTS

13. Graduates will receive the first transcript of record without charge. Subsequent copies will cost one dollar each. Requests for transcripts must be filed with the Registrar's Office, University of Maryland, Lombard and Greene Streets, Baltimore-1, Maryland.

## PRIZES

## THE FACULTY PRIZE

The faculty will award the gold medal and five certificates of honor to those six of the first ten highest ranking candidates for graduation who, during the four academic years, have exhibited outstanding qualifications for the practice of medicine.

## THE DR. A. BRADLEY GAITHER MEMORIAL PRIZE

A prize of \$25.00 is given each year by Mrs. A. Bradley Gaither as a memorial to the late Dr. A. Bradley Gaither, to the student in the senior class doing the best work in genito-urinary surgery. This prize will not be awarded during the period of acceleration.

## SCHOLARSHIPS

All scholarships are assigned for one academic year, unless specifically reawarded on consideration of an application.

Official application forms are obtainable at the Dean's office, where they should be filed two months before the ensuing academic year.

## THE DR. SAMUEL LEON FRANK SCHOLARSHIP

(Value \$100.00)

This scholarship was established by Mrs. Bertha Rayner Frank as a memorial to the late Dr. Samuel Leon Frank, an alumnus of this university.

It is awarded by the Trustees of the Endowment Fund of the University each year upon nomination by the Faculty Board "to a medical student of the University of Maryland, who in the judgment of said Council, is of good character and in need of pecuniary assistance to continue his medical course."

This scholarship is awarded to a second, third or fourth year student who has successfully completed one year's work in this school. No student may hold this scholarship for more than two years.

## THE CHARLES M. HITCHCOCK SCHOLARSHIPS

(Value \$100.00 each).

Two scholarships were established from a bequest to the School of Medicine by the late Charles M. Hitchcock, M.D., an alumnus of the university.

These scholarships are awarded annually by the Trustees of the Endowment Fund of the University, upon nomination by the Faculty Board, to students who have meritoriously completed the work of at least the first year of the course in medicine, and who present to the Board satisfactory evidence of a good moral character and of inability to continue the course without pecuniary assistance.

## THE RANDOLPH WINSLOW SCHOLARSHIP

(Value \$100.00)

This scholarship was established by the late Randolph Winslow, M.D., LL.D.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon nomination by the Faculty Board, to a "needy student of the Senior, Junior, or Sophomore Class of the Medical School."

"He must have maintained an average grade of 85% in all his work up to the time of awarding the scholarship."

"He must be a person of good character and must satisfy the Faculty Board that he is worthy of and in need of assistance."

## THE DR. LEO KARLINSKY MEMORIAL SCHOLARSHIP

(Value \$125.00)

This scholarship was established by Mrs. Ray Mintz Karlinsky as a memorial to her husband, the late Dr. Leo Karlinsky, an alumnus of the university.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon the nomination of the Faculty Board, to "a needy student of the Senior, Junior or Sophomore Class of the Medical School."

He must have maintained in all his work up to the time of awarding the scholarship a satisfactory grade of scholarship.

He must be a person of good character and must satisfy the Faculty Board that he is worthy of and in need of assistance.

## THE UNIVERSITY SCHOLARSHIP

A scholarship which entitles the holder to exemption from payment of tuition fee for the year, is awarded annually by the Faculty Board to a student of the senior class in need of assistance who presents to the Faculty Board satisfactory evidence of good character and scholarship.

## THE FREDERICA GEHRMANN SCHOLARSHIP

(Value \$200.00)

(Not open to holders of Warfield and Cohen Scholarships)

This scholarship was established by the bequest of the late Mrs. Frederica Gehrmann and is awarded to a third-year student who at the end of the second year has passed the best practical examinations in physiology, pharmacology, pathology, bacteriology, immunology, serology, surgical anatomy and neuro-anatomy.

## THE CLARENCE AND GENEVRA WARFIELD SCHOLARSHIPS

(Value \$300.00 each)

There are five scholarships established by the regents from the income of the fund bequeathed by the will of Dr. Clarence Warfield.

Terms and Conditions: These scholarships are available to students of any of the classes of the course in medicine. Preference is given to students from the counties of the state of Maryland which the Faculty Board may from time to time determine to be most in need of medical practitioners.

Any student receiving one of these scholarships must agree, after graduation and a year's internship, to undertake the practice of medicine, for a term of two years, in the county to which the student is accredited, or in a county selected by the Board. In the event that a student is not able to comply with the condition requiring him to practice in the county to which he is accredited by the Board, the money advanced by the regents shall be refunded by the student.

## THE ISRAEL AND CECELIA E. COHEN SCHOLARSHIP

(Value \$150.00)

This scholarship was established by the late Eleanor S. Cohen in memory of her parents, Israel and Cecelia E. Cohen. Terms and conditions: This scholarship will be available to students of any one of the classes of the course in medicine; preference is given to students of the counties in the state of Maryland which the Faculty Board may from time to time determine to be most in need of medical practitioners. Any student receiving one of these scholarships must, after graduation and a year's internship, agree to undertake the practice of medicine for a term of two years in the county to which the student is accredited, or in a county selected by the council. In the event that a student is not able to comply with the condition requiring him to practice in the county to which he is accredited by the Board, the money advanced by the regents shall be refunded.



## THE DR. HORACE BRUCE HETRICK SCHOLARSHIP

(Value \$125.00)

This scholarship was established by Dr. Horace Bruce Hetrick as a memorial to his sons, Bruce Hayward Hetrick and Augustus Christian Hetrick. It is to be awarded by the Faculty Board to a student of the senior class.

## THE HENRY ROLANDO SCHOLARSHIP

(Value approximately \$250.00)

The Henry Rolando Scholarship was established by the Board of Regents of the University of Maryland from a bequest to the Board by the late Anne H. Rolando for the use of the Faculty of Medicine.

This scholarship will be awarded each academic year on the recommendation of the Faculty Board to a "poor and deserving student."

## THE READ SCHOLARSHIPS

The sum of \$500.00 is now available to cover two (2) scholarships in the amount of \$250.00 each for the scholastic year, commencing October 17, 1944, as a donation from the Read Drug and Chemical Company of Baltimore, Maryland. Two students are to be selected by the Dean of the School in collaboration with the Scholarship and Loan Committee of the Medical School with the provision that the students selected shall be worthy, deserving, civilian students, residents of the State of Maryland.

## LOAN FUNDS

## W. K. KELLOGG FUND

This loan fund was established for the academic year 1942 with money granted by the W. K. Kellogg Foundation. The interest paid on the loans, together with the principal of the fund as repaid, will be used to found a rotating loan fund. Loans will be made on the basis of need, character and scholastic attainment.

## FACULTY OF MEDICINE LOAN FUND

A Faculty of Medicine Loan Fund was established with money derived from the bequest of Dr. William R. Sanderson, Class 1882, and the gift of Dr. Albert Stein, Class 1907. Loans will be made on the basis of need, character, and scholastic ability.

## ORGANIZATION OF THE CURRICULUM

The curriculum is organized under twelve departments.

1. Anatomy (including Histology and Embryology).
2. Physiology.
3. Bacteriology and Immunology.
4. Biological Chemistry.
5. Pharmacology and Materia Medica.
6. Pathology.
7. Medicine (including Medical Specialties).
8. Surgery (including Surgical Specialties).
9. Obstetrics.
10. Gynecology.
11. Ophthalmology.
12. Roentgenology.

The instruction is given in four academic years of graded work.

Several courses of study extend through two years or more, but in no case are the students of different years thrown together in the same course of teaching.

The first and second years are devoted largely to the study of the structures and functions of the normal body. Laboratory work occupies most of the student's time during these two years.

Some introductory instruction in medicine and surgery is given in the second year. The third and fourth years are almost entirely clinical.

A special feature of instruction in the school is the attempt to bring together teacher and student in close personal relationship. In many courses of instruction the classes are divided into small groups and a large number of instructors insures attention to the requirements of each student.

In most courses the final examination as the sole test of proficiency has disappeared and the student's final grade is determined largely by partial examinations, recitations and assigned work carried on throughout the course.

### DEPARTMENT OF GROSS ANATOMY

EDUARD UHLENHUTH.....	Professor of Anatomy
FRANK H. J. FIGGE.....	Associate Professor of Gross Anatomy
F. GAYNOR EVANS.....	Assistant Professor of Gross Anatomy
VERNON E. KRAHL.....	Instructor in Gross Anatomy
*HARRY A. TEITELBAUM.....	Instructor in Gross Anatomy
WILLIAM B. SETTLE.....	Assistant in Gross Anatomy
MILTON L. SOLOMON.....	Research Associate in Gross Anatomy

OTTO C. BRANTIGAN.....	Professor of Surgical Anatomy
*HARRY C. HULL.....	Assistant Professor of Surgery
E. EUGENE COVINGTON.....	Associate in Surgical Anatomy
W. WALLACE WALKER.....	Instructor in Surgical Anatomy
*HARRY C. BOWIE.....	Assistant in Surgical Anatomy
*HERBERT E. REIFSCHNEIDER.....	Assistant in Surgery

GROSS ANATOMY. *First Year.* Six lectures and conferences and seventeen hours of laboratory (dissection of the human subject) are given each week during the first semester. Drs. Uhlenhuth, Figge, Evans and Krahl.

Total hours: 350.

TOPOGRAPHIC AND SURGICAL ANATOMY. *Second Year.* The course is designed to bridge the gap between abstract anatomy and clinical anatomy as applied to the study and practice of medicine and surgery. Students are required to demonstrate all points, outlines, and regions on the cadaver. Underlying regions are dissected to bring out outlines and relations of structures.

Two lectures and two laboratory periods are given each week during the second semester. Drs. Brantigan, Covington, Walker, and Settle

Total hours: 96.

ADVANCED ANATOMY (*elective course*). Selected problems in gross anatomy. This course is intended to offer to the sophomore student an opportunity of extending the knowledge secured in the freshman course. Drs. Uhlenhuth, Figge, Evans and Brantigan.

Total hours: 64.

In addition to the above course, facilities for special anatomical problems are offered to the more advanced student and physician.

*Graduate Courses.* Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

#### DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY

CARL L. DAVIS.....	Professor of Anatomy
O. G. HARNE.....	Associate Professor of Histology
JOHN F. LUTZ .....	Assistant Professor of Histology
WALTER L. HARD..	Assistant Professor of Histology

*First Year.* The course in histology is divided equally between the study of the fundamental tissues and that of organs. Throughout the entire course the embryology of the part being studied precedes the study of the fully developed tissue. Thus embryology becomes a correlated part of the whole subject of microscopic anatomy and not an independent subject.

Each student is furnished a set of histological slides, previously prepared in our own laboratory, thus insuring a uniform and satisfactory quality of material for study and permitting the time of the student to be expended in the study of material rather than in the technic of its preparation. The object of the course is to present the evidence of function as shown by the structure of tissues and organs. Drs. Davis, Lutz, Harne, and Hard.

An optional laboratory course is offered. This supplements the required course giving laboratory experience which can not be incorporated in the former. No added charge is made for the course.

Total hours: 150.

#### NEURO-ANATOMY

*First Year.* Neuro-anatomy embraces a study of the fundamental structure of the central nervous system as applied to its function. An abundance of material permits of individual dissection of the human brain. A series of appropriately

stained sections of the human brain stem is furnished each student for the microscopic study of the internal structure of the nervous system. Drs. Davis, Lutz, Harne, and Hard.

Total hours: 100.

*Graduate Courses.* Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

#### DEPARTMENT OF PHYSIOLOGY

WILLIAM R. AMBERSON.....	Professor of Physiology
DIETRICH CONRAD SMITH.....	Associate Professor of Physiology
ROBERT H. OSTER.....	Associate Professor of Physiology
RUBERT S. ANDERSON.....	Assistant Professor of Physiology
JOYE J. JENNINGS.....	Instructor in Physiology
MARY E. CHENN.....	Assistant in Physiology

Five lectures, one conference and two laboratory periods a week, 1st semester of each academic year. The fundamental concepts of physiology are presented with special reference to mammalian problems.

Total hours: 224.

*Graduate Courses.* Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

#### DEPARTMENT OF BACTERIOLOGY AND IMMUNOLOGY

FRANK W. HACHTEL.....	Professor of Bacteriology
JAMES G. MCALPINE.....	Associate Professor of Bacteriology
★HENRY F. BUETTNER.....	Instructor in Bacteriology
H. EDMUND LEVIN.....	Instructor in Bacteriology

The principles of general bacteriology are taught by quiz, conference, and lecture.

Instruction in bacteriology is given in the laboratory to students of the second year class during the first semester. This includes the methods of preparation of culture media, the study of pathogenic bacteria, and the bacteriological examination of water and milk. The bacteriological diagnosis of communicable diseases is also included.

The principles of immunology are presented by means of quizzes, conferences and lectures to the second year class in the second semester.

The course includes a consideration of infection and immunity, the nature and action of the various antibodies, complement fixation and flocculation tests, hypersensitiveness, and the preparation of bacterial vaccines.

Experiments are carried out by the class in the laboratory. During the latter half of the semester the class is divided into sections.

Total hours: Bacteriology 120.

Immunology 72.

*Graduate Courses.* Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.



## DEPARTMENT OF BIOLOGICAL CHEMISTRY

H. BOYD WYLIE.....	Professor of Biological Chemistry
EMIL G. SCHMIDT.....	Associate Professor of Biological Chemistry
GLENN S. WEILAND.....	Assistant Professor of Biological Chemistry
FRANK N. OGDEN.....	Associate in Biological Chemistry
ANN VIRGINIA BROWN.....	Instructor in Biological Chemistry
JANE LOUISE BANKER.....	Weaver Fellow in Biological Chemistry

This course is designed to present the principles of biological chemistry and to indicate their applications to the clinical aspects of medicine. The phenomena of living matter and its chief ingredients, secretions and excretions are discussed in lectures and conferences and examined experimentally. Training is given in biochemical methods of investigation. Total hours: 208.

*Graduate Courses.* Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

## DEPARTMENT OF PHARMACOLOGY

JOHN C. KRANTZ, JR.....	Professor of Pharmacology
C. JELLEFF CARR.....	Associate Professor of Pharmacology
WILLIAM ELLSWORTH EVANS, JR.....	Associate Professor of Pharmacology
RUTH MUSSER.....	Instructor in Pharmacology
HENRY L. WOLLENWEBER.....	Assistant in Pharmacology
WILLIAM G. HARNE.....	Demonstrator in Pharmacology
FREDERICK K. BELL.....	U. S. Pharmacopoeia Fellow
DOROTHY K. SHIPLEY.....	Fellow in Pharmacology
HARRY K. IVAMOTA.....	Emerson Fellow in Pharmacology
VIRGINIA M. WATERS.....	Emerson Fellow in Pharmacology

This course is designed to include those phases of pharmacology necessary for an intelligent use of drugs in the treatment of disease. The didactic instruction includes materia medica, pharmacy, prescription-writing, toxicology, posology, pharmacodynamics, and experimental therapeutics. The laboratory exercises parallel the course of lectures.

In addition, optional conference periods and lectures are available for students desiring further instruction or advice.

Total hours: 192.

*Graduate Courses.* Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

## DEPARTMENT OF PATHOLOGY

HUGH R. SPENCER.....	Professor of Pathology
ROBERT B. WRIGHT.....	Associate Professor of Pathology
C. GARDNER WARNER.....	Associate Professor of Pathology
*WALTER C. MERKEL.....	Assistant Professor of Pathology
*D. JAMES GREINER.....	Assistant Professor of Pathology
HOWARD J. MALDEIS.....	Associate in Pathology
ALBERT E. GOLDSTEIN.....	Associate in Pathology
FRANK B. KINDELL.....	Associate in Pathology
JOHN A. WAGNER.....	Associate in Pathology

*WILLIAM S. LOVE, JR.	Instructor in Pathology
LEON FREEDOM	Instructor in Pathology
MILTON S. SACKS	Instructor in Pathology
HENRY L. WOLLENWEBER	Instructor in Pathology
*EDWARD F. COTTER	Instructor in Pathology
BENEDICT SKITARELIC	Instructor in Pathology
DEXTER L. REIMANN	Instructor in Pathology
*CONRAD B. ACTON	Assistant in Pathology
*HOWARD B. MAYS	Assistant in Pathology
*EPHRAIM T. LISANSKY	Assistant in Pathology
*KARL F. MECH	Assistant in Pathology
D. MCCLELLAND DIXON	Assistant in Pathology

Courses of instruction in pathology are given during the second and third years. The courses are based on the previous study of normal structure and function and aim to outline the history of disease. The relationship between clinical symptoms and anatomical lesions is constantly stressed.

GENERAL PATHOLOGY. *Second Semester, Second Year.* This course includes the study of disturbances of the body fluids; disturbances of structure, nutrition and metabolism of cells; disturbances of fat, carbohydrate and protein metabolism; disturbances of pigment metabolism; inflammation and tumors.

Laboratory instruction is based on the study of prepared slides (loan collection) and corresponding gross material.

APPLIED PATHOLOGY, INCLUDING GROSS MORBID ANATOMY AND MORBID PHYSIOLOGY. *Third Year.* The laboratory instruction in this course is carried out in small teaching museums where prepared specimens and material from autopsies with clinical histories and sections are available for study. For this work the class is divided into small groups. Clinical correlation is stressed.

AUTOPSIES. *Third Year.* Students in small groups attend autopsies at the morgues of the University Hospital and the Baltimore City Hospitals.

CLINICAL-PATHOLOGICAL CONFERENCE. (*Fourth Year.*) These exercises are held in collaboration with the Department of Medicine. Selected cases are discussed and autopsy findings are presented.

Second year	184 hours
Third year	160 hours
Fourth year	30 hours
Total	374 hours

#### DEPARTMENT OF MEDICINE

*MAURICE C. PINCOFFS	Professor of Medicine
THOMAS P. SPRUNT	Acting Head of the Department of Medicine and Professor of Clinical Medicine
JOSEPH E. GICHNER	Professor of Clinical Medicine and Physical Therapeutics
G. CARROLL LOCKARD	Professor of Clinical Medicine
HARVEY G. BECK	Professor of Clinical Medicine
H. RAYMOND PETERS	Professor of Clinical Medicine
PAUL W. CLOUGH	Associate Professor of Medicine

SYDNEY R. MILLER .....	Associate Professor of Medicine
WALTER A. BAETJER.....	Associate Professor of Medicine
*WILLIAM S. LOVE, JR.....	Associate Professor of Medicine
*RAYMOND HUSSEY.....	Associate Professor of Medicine
*LOUIS A. M. KRAUSE.....	Associate Professor of Medicine
T. NELSON CAREY.....	Associate Professor of Medicine
CHARLES C. W. JUDD.....	Associate Professor of Medicine
WILLIAM H. SMITH.....	Associate Professor of Clinical Medicine
HOWARD J. MALDEIS.....	Associate Professor of Legal Medicine
GEORGE McLEAN.....	Assistant Professor of Medicine
JOHN E. LEGGE.....	Assistant Professor of Medicine
THOMAS C. WOLFF.....	Assistant Professor of Medicine
H. M. BUBERT.....	Assistant Professor of Medicine
J. S. EASTLAND.....	Assistant Professor of Medicine
MILTON S. SACKS.....	Assistant Professor of Medicine
*LEWIS P. GUNDRY.....	Assistant Professor of Medicine
CHARLES R. GOLDSBOROUGH.....	Lecturer in Medicine
W. N. BISPHAM, Col., M. C., U. S. A. (ret.).....	Lecturer in Medicine
CLARK H. YEAGER.....	Lecturer in Tropical Medicine
WETHERBEE FORT.....	Associate in Medicine
FRANK J. GERAGHTY.....	Associate in Medicine
E. H. TONOLLA.....	Associate in Medicine
*HARRY V. LANGELOTTIG.....	Associate in Medicine
SOL SMITH.....	Associate in Medicine
*SAMUEL T. HELMS.....	Instructor in Medicine
DAVID TENNER.....	Instructor in Medicine
*R. B. MITCHELL, JR.....	Instructor in Medicine
SAMUEL LEGUM.....	Instructor in Medicine
*M. S. SHILING.....	Instructor in Medicine
H. EDMUND LEVIN.....	Instructor in Medicine
ROBERT A. REITER.....	Instructor in Medicine
W. GRAFTON HERSPERGER.....	Instructor in Medicine
MEYER W. JACOBSON.....	Instructor in Medicine
*CONRAD ACTON.....	Instructor in Medicine
*HUGH G. WHITEHEAD.....	Instructor in Medicine
*PHILIP D. FLYNN.....	Instructor in Medicine
*EDWARD S. KALLINS.....	Instructor in Medicine
*IRVING FREEMAN.....	Instructor in Medicine
JOHN A. MYERS.....	Instructor in Medicine
KURT LEVY.....	Instructor in Medicine
*WILLIAM G. HELFRICH.....	Instructor in Medicine
*FRANCIS G. DICKEY.....	Instructor in Medicine
C. EDWARD LEACH.....	Instructor in Medicine
LAWRENCE M. SERRA.....	Instructor in Medicine
MARIE A. ANDERSCH.....	Instructor in Medicine
*W. H. TRIPLETT.....	Assistant in Medicine
MORRIS FINE.....	Assistant in Medicine
WILLIAM H. GRENZER.....	Assistant in Medicine
*GEORGE SILVERTON.....	Assistant in Medicine
*LAWRENCE KATZENSTEIN.....	Assistant in Medicine
LEON ASHEMAN.....	Assistant in Medicine

*HARRY M. ROBINSON, JR.	Assistant in Medicine
NATHANIEL M. BECK	Assistant in Medicine
*JOSEPH M. BLUMBERG	Assistant in Medicine
*PAUL E. CARLINER	Assistant in Medicine
SAMUEL SNYDER	Assistant in Medicine
*S. EDWIN MULLER	Assistant in Medicine
LOUIS J. KROLL	Assistant in Medicine
*JOHN L. ATKINS	Assistant in Medicine
*WILLIAM K. WALLER	Assistant in Medicine
*EPHRAIM T. LISANSKY	Assistant in Medicine
*NACHMAN DAVIDSON	Assistant in Medicine
*SAMUEL T. R. REVELL	Assistant in Medicine
*ARTHUR KARFGIN	Assistant in Medicine
*JOSEPH E. MUSE, JR.	Assistant in Medicine
DANIEL WILFSON, JR.	Assistant in Medicine
*JOSEPH B. GROSS	Assistant in Medicine
*SAMUEL J. HANKIN	Assistant in Medicine
*ROBERT C. CRAWFORD	Assistant in Medicine
*CHARLES W. KNERLER	Assistant in Medicine
*EDWIN O. DAUE, JR.	Assistant in Medicine
*ROBERT L. GIBBS	Assistant in Medicine
*JAMES R. KARNS	Assistant in Medicine
*ROBERT B. MEARNS	Assistant in Medicine
*WILLIAM H. KAMMER, JR.	Assistant in Medicine
BENEDICT SKITARELIC	Assistant in Medicine
L. ANN HELLEN	Assistant in Medicine
LESLIE HARRELL PIERCE	Assistant in Medicine
AUDREY M. FUNK	Assistant in Medicine
*FREDERICK J. VOLLMER	Assistant in Medicine
WILFRED H. TOWNSHEND, JR.	Hitchcock Fellow in Medicine
MARGARET VIRGINIA PALMER	Hitchcock Fellow in Medicine

## GENERAL OUTLINE

### SECOND YEAR

Introduction to clinical medicine.

- (a) Introductory physical diagnosis. (1 hour a week, first semester; 2 hours a week, second semester.)
- (b) Medical clinics. (1 hour a week, second semester.)

### THIRD YEAR

- I. The methods of examination (13 hours a week). (a) History taking. (b) Physical diagnosis. (c) Clinical pathology.

These subjects are taught and practiced in the hospital out-patient department and in the clinical laboratory.

- II. The principles of medicine (200 hours).

- (a) Lectures, clinics and demonstrations in general medicine, neurology, pediatrics psychiatry and preventive medicine.

- III. The principles of therapeutics (15 hours). Lectures and demonstrations.



## FOURTH YEAR

The practice of medicine.

I. Clinical clerkship on the medical wards. (26 hours a week for ten weeks.)

(a) Responsibility, under supervision, for the history, physical examination, laboratory examinations and progress notes of assigned cases.

(b) Ward classes in general medicine, the medical specialties, and therapeutics.

II. Clinics in general medicine and the medical specialties.

(6 hours a week.)

III. Dispensary work in the medical specialties.

IV. Clinical-pathological conferences (1 hour a week).

## MEDICAL DISPENSARY WORK

The medical dispensaries of both the Mercy and the University Hospitals are utilized for teaching in the third year. Each student spends two hours daily for ten weeks in dispensary work. The work is done in groups of four to six students under an instructor. Systematic history-taking is especially stressed. Physical findings are demonstrated. The student becomes familiar with the commoner acute and chronic disease processes.

## PHYSICAL DIAGNOSIS

*Second Year.* Didactic lectures and practical demonstrations in topographical anatomy and normal physical signs. Dr. McLean.

*Third Year.* The class is divided into small groups and each section receives instruction for two hours daily for ten weeks. This course is given at the Baltimore City Hospitals. The large clinical material there is utilized to give each student the opportunity to familiarize himself with the common types of bodily structure, with the normal variations in physical signs and with the physical signs of the chief pulmonary, circulatory and abdominal diseases. A course of lectures (1 hour a week) on physical diagnosis supplements the practical work in this subject. Drs. Wolff, Reiter, Ashman, Kroll, Legum and Wilfson.

## THERAPEUTICS

*Third Year.* General therapeutics and materia medica are taken up and an effort is made to familiarize the student with the practical treatment of disease. The special therapy of the chief diseases is then reviewed. One hour a week. Dr. Lockard.

*Fourth Year.* Special consideration is given to the practical application of therapeutic principles in bedside teaching and the chief therapeutic methods are demonstrated.

Students attend therapeutic ward rounds once a week throughout their medical trimester.

## TROPICAL MEDICINE

Certain phases of tropical medicine are considered in the course on clinical pathology. In addition, Dr. Clark H. Yeager conducts a course of lectures and

demonstrations to the entire fourth year class. The course occupies one hour weekly for twenty weeks.

### TUBERCULOSIS

During the third year in connection with the instruction in physical diagnosis a practical course is given at the Municipal Tuberculosis Hospital. Stress is laid upon the recognition of the physical signs of the disease, as well as upon its symptomatology and gross pathology.

### CARDIOLOGY

In the third year a series of lectures and clinics correlated with pathological studies is given the entire class.

During the fourth year an elective course in cardiology is offered at the Mercy Hospital. The course occupies one and one-half hours weekly. Physical diagnosis, electrocardiography and the therapeutic management of cardiac cases are stressed.

Elective outpatient work is available also to members of the fourth year class in the cardiac clinic of the University Hospital.

### SYPHILIS

*Third Year.* During the third year the subject of syphilis is dealt with in the lecture course.

*Fourth Year.* An elective course in the therapeutic management of syphilis is offered in the dispensary.

### CLINICAL PATHOLOGY

#### MILTON S. SACKS

Assistant Professor of Medicine and Head of Department of Clinical Pathology

H. RAYMOND PETERS.....Professor of Clinical Medicine

SOL SMITH.....Associate in Medicine

\*SAMUEL T. HELMS.....Instructor in Medicine

JOHN A. MYERS.....Instructor in Medicine

MARIE A. ANDERSCH.....Biochemist, University Hospital, Instructor in Medicine

\*HUGH G. WHITEHEAD.....Assistant in Medicine

\*JOSEPH M. BLUMBERG.....Assistant in Medicine

\*S. EDWIN MULLER.....Assistant in Medicine

JOHN A. WAGNER.....Assistant in Medicine

DEXTER L. REIMANN.....Assistant in Medicine

BENEDICT SKITARELIC.....Assistant in Medicine

L. ANN HELLEN.....Assistant in Medicine

AUDREY M. FUNK.....Assistant in Medicine

During the third year the student is thoroughly drilled in the technic of the usual clinical laboratory work, so that he is able to perform all routine examinations which may be called for during his fourth year, in connection with the work in the wards and dispensary.

The practical work is supplemented by a series of didactic lectures and demonstrations in which the entire teaching staff of the department takes an active part.

The microscopical and chemical study of blood, exudates and transudates, gastric juice, spinal fluid, feces and urine are successively taken up, and special attention directed to the clinical significance of the findings.

Clinical parasitology from the standpoint of the infecting agent and the carrier is given careful consideration.

The entire course is thoroughly practical. Each student provides his own microscope and blood counters and is supplied a haemoglobinometer for his exclusive use. Every two students are equipped with a special laboratory outfit for all routine purposes.

During the fourth year the student applies in the laboratories of the various affiliated hospitals what he has learned during the preceding year. He is also supplied with a laboratory outfit which is sufficiently complete to enable him to work independently of the general equipment. Special instructors are available during certain hours to give necessary assistance and advice.

### GASTRO-ENTEROLOGY

THEODORE H. MORRISON.....	Clinical Professor of Gastro-Enterology
MAURICE FELDMAN.....	Assistant Professor of Gastro-Enterology
ZACHARIAH MORGAN.....	Assistant Professor of Gastro-Enterology
*SAMUEL MORRISON.....	Assistant Professor of Gastro-Enterology
Z. VANCE HOOPER.....	Associate in Gastro-Enterology
ALBERT J. SHOCHAT.....	Instructor in Gastro-Enterology
*FRANCIS G. DICKEY.....	Instructor in Medicine
JOHN A. MYERS.....	Assistant in Gastro-Enterology
NATHANIEL M. BECK.....	Assistant in Gastro-Enterology
ALFRED S. LEDERMAN.....	Assistant in Gastro-Enterology

*Third Year.* A series of six lectures is given on the diseases of the digestive tract.

*Fourth Year.* Clinics and demonstrations are given to the class for one hour a week; dispensary instruction to small groups throughout the entire session. Practical instruction is given in the use of modern methods of study of the diseases of the gastro-intestinal tract.

### PSYCHIATRY

ROSS McC. CHAPMAN.....	Professor of Psychiatry
RALPH P. TRUITT.....	Associate Professor of Psychiatry
LAWRENCE F. WOOLLEY.....	Associate Professor of Psychiatry
*HARRY GOLDSMITH.....	Assistant Professor of Psychiatry
*H. W. NEWELL.....	Assistant Professor of Psychiatry
*HARRY M. MURDOCK.....	Assistant Professor of Psychiatry
*LESLIE B. HOHMAN.....	Lecturer in Psychiatry
WILLIAM W. ELGIN.....	Associate in Psychiatry
*A. RUSSELL ANDERSON.....	Instructor in Psychiatry
*PHILIP S. WAGNER.....	Instructor in Psychiatry
HANS W. LOEWALD.....	Instructor in Psychiatry
J. G. N. CUSHING.....	Instructor in Psychiatry
FRANCIS McLAUGHLIN.....	Instructor in Psychiatry
SAMUEL NOVEY.....	Instructor in Psychiatry

*First Year.* The student attends lectures and demonstrations at the Sheppard and Enoch Pratt Hospital two hours a week for a period of sixteen weeks. An opportunity is given to observe and talk with patients. The primary object of instruction lies in the significance of personality development in the normal as well as in the abnormal individual.

*Second Year.* The student attends fourteen demonstration lectures on psychopathology.

*Third Year.* Six hours are devoted to the demonstration of clinical psychopathology; six hours are given to clinical presentation of the psychoses; twelve hours are used for clinical lectures with demonstration and discussion of the management of psychiatric problems encountered in the general practice of medicine; thirty hours are given to history-taking and study of patients in the out-patient clinic.

*Fourth Year.* The neuroses, psychoneuroses and psychoses are dealt with in ten hours of lectures and demonstrations. In this year the class is divided into sections for clinical conferences on selected cases.

#### PEDIATRICS

C. LORING JOSLIN .....	Professor of Pediatrics
EDGAR B. FRIEDENWALD .....	Professor of Clinical Pediatrics
★T. CAMPBELL GOODWIN .....	Associate Professor of Pediatrics
HUGH W. JOSEPHS .....	Associate Professor of Pediatrics
JOHN H. TRABAND .....	Assistant Professor of Pediatrics
ALBERT JAFFE .....	Assistant Professor of Pediatrics
A. H. FINKELSTEIN .....	Assistant Professor of Pediatrics
FREDERICK B. SMITH .....	Assistant Professor of Pediatrics
J. EDMUND BRADLEY .....	Assistant Professor of Pediatrics
CLEWELL HOWELL .....	Associate in Pediatrics
SAMUEL S. GLICK .....	Associate in Pediatrics
WILLIAM M. SEABOLD .....	Associate in Pediatrics
G. BOWERS MANSDORFER .....	Associate in Pediatrics
★M. PAUL BYERLY .....	Instructor in Pediatrics
★JEROME FINEMAN .....	Instructor in Pediatrics
★B. MATTHEW DEBUSKEY .....	Instructor in Pediatrics
★GIBSON J. WELLS .....	Instructor in Pediatrics
W. J. SCHMITZ .....	Assistant in Pediatrics
★ISRAEL P. MERANSKI .....	Assistant in Pediatrics
★LAURISTON L. KEOWN .....	Assistant in Pediatrics
★EARLE S. SCOTT .....	Assistant in Pediatrics
WILLIAM EARL WEEKS .....	Assistant in Pediatrics
★THOMAS A. HEDRICK .....	Assistant in Pediatrics
MARY L. HAYLECK .....	Assistant in Pediatrics

*Third Year.* The course is presented as follows:

Lectures on infant feeding and the fundamentals of diseases of infants and children. (15 hours.)

Lectures on contagious diseases in conjunction with the Department of Hygiene and Preventive Medicine. (14 hours.)

A special course in physical diagnosis is given at City Hospitals. (20 hours.)

Clinical conferences demonstrating diseases of the new-born. (6 hours.)



*Fourth Year.* An amphitheatre clinic is given at which patients are shown to demonstrate the features of the diseases discussed. (30 hours.)

Conferences and demonstrations are given in problems concerning diagnosis, care, treatment and clinical pathology of the diseases of infants and children. (30 hours.)

Students are assigned subjects for the preparation of theses.

Clinical clerkships are assigned on the pediatric wards, where experience is gained in taking histories, making physical examinations, doing routine laboratory work, and following up the patients' progress. This is under the supervision of the visiting staff. (140 hours.)

Instruction is given in the pediatric clinic of the out-patient department of the University Hospital. This consists of 1½ hours daily for five weeks—30 minutes each day being devoted to a clinical demonstration of some interesting case by a member of the staff; one hour daily to taking histories and making physical examinations under supervision of one of the staff instructors. (45 hours.)

Total hours: 300.

### NEUROLOGY

IRVING J. SPEAR .....	Professor of Neurology
ANDREW C. GILLIS .....	Professor of Neurology
LEON FREEDOM .....	Associate Professor of Neurology
BENJAMIN PUSHKIN .....	Assistant Professor of Neurology
PHILIP F. LERNER .....	Instructor in Neurology
*WILLIAM L. FEARING .....	Instructor in Neurology
*EDWARD F. COTTER .....	Assistant in Neurology
*HARRY A. TEITELBAUM .....	Assistant in Neurology
JOHN W. MACHEN .....	Assistant in Neurology
GEORGE C. MEDAIRDY .....	Assistant in Neurology

*Second Year.* Fifteen one-hour lectures are given to correlate the anatomy and physiology of the nervous system with clinical neurology.

*Third Year.* Twenty hours of instruction are given to the whole class in neuropathology supplemented with pathological demonstrations. Sixteen lecture-demonstrations are given in which the major types of the diseases of the nervous system are discussed. A course is also given at the Baltimore City Hospitals, comprising eight periods of two hours each, in which the students in small groups carry out complete neurological examinations of selected cases which illustrate the chief neurological syndromes.

*Fourth Year.* A clinical conference one hour each week is given to the whole class at the University and Mercy Hospitals. All patients presented at these clinics are carefully examined. Complete written records are made by the students who demonstrate the patients before the class. The patients are usually assigned one or two weeks before they are presented, and each student in the class must study and present one or more patients during the year.

*Ward Class Instruction.* Nine hours of instruction are given to each student in small sections at the University and Mercy Hospitals. In these classes the students come in close personal contact with the patients in the wards under the supervision of the instructor.

*Dispensary Instruction.* Small sections are instructed in the dispensaries of the University and Mercy Hospitals five afternoons each week. In this way students are brought into contact with nervous diseases in their early and late manifestations.

#### HYGIENE AND PUBLIC HEALTH

HUNTINGTON WILLIAMS.....	Professor of Hygiene and Public Health
WILLIAM H. F. WARTHEN.....	Assistant Professor of Hygiene and Public Health
ROSS DAVIES.....	Assistant Professor of Hygiene and Public Health
MYRON G. TULL.....	Instructor in Hygiene and Public Health

*Third Year.* A one-hour lecture is given to the whole class each Monday during both semesters. Basic instruction is afforded in the clinical and public health aspects of the communicable diseases including syphilis and tuberculosis. The lectures are under the auspices of the Department of Medicine and are given by staff members of that department, including physicians representing pediatrics, hygiene and public health, and the Baltimore City Health Department.

*Fourth Year.* Six one-hour lectures are given to the whole class at the beginning of the first semester and are on important public health procedures such as maternal and child hygiene, sewage disposal, vital statistics, interstate and international quarantine and research in public health. Elective work is also assigned at Sydenham Hospital, the one-hundred bed communicable disease hospital of the City Health Department, and at its Western Health District, 617 West Lombard Street, where the District Health Officer arranges for home visiting and the student prepares and presents a Home Survey Report.

The course deals with the fundamentals of public health and supplements the work in the third year. The major emphasis in both years is on the practice of preventive medicine and the relation of prevention to diagnosis and treatment, and on the civic and social implications of the medical services.

The major emphasis in both years is on the practice of preventive medicine and the relation of prevention to diagnosis and treatment.

*Note.* Because of the acceleration of the wartime curriculum it has been necessary to discontinue temporarily the following instruction in the fourth year: (1) two-hour seminar periods for the whole class, in groups of ten to fifteen students on six Wednesday afternoons. These sessions enable the students themselves to prepare birth and death certificates and to understand a selected group of laboratory and sanitary procedures of a practical nature. (2) Four Wednesday afternoon field-inspection trips for each third of the class. These trips, under guidance of full time public health workers, include visits to the city water filtration plant, the sewage disposal plant, a milk pasteurization plant and bakery and an industrial plant which has an active program of hygiene.

#### LEGAL MEDICINE

HOWARD J. MALDEIS.....	Associate Professor of Legal Medicine Chief Medical Examiner, Maryland
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*Third Year.* This course embraces a summary of some of the following: Proceedings in criminal and civil prosecution, medical evidence and testimony, identity

and its general relations, personal identity, rape, criminal abortions, signs of death, wounds in their medico-legal relations, natural and homicidal death, malpractice, insanity, and medico-legal autopsies.

Total hours: 3.

#### DEPARTMENT OF SURGERY

ARTHUR M. SHIPLEY .....	Professor of Surgery
★WALTER D. WISE .....	Professor of Surgery
CHARLES REID EDWARDS .....	Professor of Surgery
ELLIOTT H. HUTCHINS .....	Professor of Surgery
PAGE EDMUNDS .....	Professor of Traumatic Surgery
CHARLES BAGLEY, JR. ....	Professor of Neurological Surgery
THOMAS B. AYCOCK .....	Professor of Clinical Surgery
F. L. JENNINGS .....	Professor of Clinical Surgery
★D. J. PESSAGNO .....	Clinical Professor of Surgery
★MONTE EDWARDS .....	Clinical Professor of Surgery
CHARLES A. REIFSCHNEIDER .....	Clinical Professor of Traumatic Surgery
RICHARD G. COBLENTZ .....	Clinical Professor of Neurological Surgery
THOMAS R. CHAMBERS .....	Associate Professor of Surgery
R. W. LOCHER .....	Associate Professor of Clinical Surgery
EDWARD S. JOHNSON .....	Associate Professor of Surgery
N. CLYDE MARVEL .....	Associate Professor of Surgery
GRANT E. WARD .....	Associate Professor of Surgery
CYRUS F. HORINE .....	Associate Professor of Surgery
CHARLES W. MAXSON .....	Associate Professor of Surgery
★GEORGE H. YEAGER .....	Associate Professor of Surgery
★HENRY F. ULLRICH .....	Associate Professor of Orthopaedic Surgery
C. W. PEAKE .....	Associate Professor of Surgery
EDWARD A. KITLOWSKI .....	Associate Professor of Plastic Surgery
OTTO C. BRANTIGAN .....	Associate Professor of Surgery
H. F. BONGARDT .....	Assistant Professor of Surgery
★HARRY C. HULL .....	Assistant Professor of Surgery
I. O. RIDGELY .....	Associate in Surgery
JAMES W. NELSON .....	Associate in Surgery
★I. RIDGEWAY TRIMBLE .....	Associate in Surgery
★RICHARD T. SHACKELFORD .....	Associate in Surgery
★SIMON H. BRAGER .....	Associate in Surgery
RAYMOND F. HELFRICH .....	Associate in Surgery
E. EUGENE COVINGTON .....	Associate in Surgery
LUTHER E. LITTLE .....	Associate in Surgery
★MURRAY M. COPELAND .....	Associate in Surgery
THURSTON R. ADAMS .....	Associate in Surgery
WILLIAM B. SETTLE .....	Associate in Surgery
WILLIAM R. JOHNSON .....	Instructor in Surgery
E. M. HANRAHAN .....	Instructor in Surgery
★KARL J. STEINMUELLER .....	Instructor in Surgery
J. DUER MOORES .....	Instructor in Surgery
★ARTHUR G. SIWINSKI .....	Instructor in Surgery
CALVIN HYMAN .....	Instructor in Surgery
W. WALLACE WALKER .....	Instructor in Surgery

CLYDE F. KARNs.....	Instructor in Surgery
WILLIAM R. GERAGHTY.....	Assistant in Surgery
HOWARD B. McELwAIN.....	Assistant in Surgery
A. V. BUCHNESS.....	Assistant in Surgery
T. J. TOUHEY.....	Assistant in Surgery
SAMUEL H. CULVER.....	Assistant in Surgery
ALBERT R. WILKERSON.....	Assistant in Surgery
L. T. CHANCE.....	Assistant in Surgery
SAMUEL McLANAHAN, JR.....	Assistant in Surgery
W. ALLEN DECKERT.....	Assistant in Surgery
*SAMUEL E. PROCTOR.....	Assistant in Surgery
GEORGE GOVATOS.....	Assistant in Surgery
*DWIGHT M. CURRIE.....	Assistant in Surgery
ROBERT F. HEALY.....	Assistant in Surgery
HERBERT M. FOSTER.....	Assistant in Surgery
*DANIEL R. ROBINSON.....	Assistant in Surgery
ROBERT F. CHENOWITH.....	Assistant in Surgery
*JOSEPH V. JERARDI.....	Assistant in Surgery
*DONALD B. GROVE.....	Assistant in Surgery
*WILLIAM S. CHENEY.....	Assistant in Surgery
*HERBERT E. REIFSCHNEIDER.....	Assistant in Surgery
*GEORGE H. BROUILLET.....	Assistant in Surgery
*HARRY C. BOWIE.....	Assistant in Surgery
*WILLIAM M. GARLICK.....	Assistant in Surgery
*FREDERICK W. WAKNITZ.....	Assistant in Surgery
*STUART G. COUGHLAN.....	Assistant in Surgery
*CLARENCE P. SCARBOROUGH.....	Assistant in Surgery
HAROLD H. BURNS.....	Assistant in Surgery
*ERNEST W. MACK.....	Assistant in Surgery
*HUGH H. TROUT, JR.....	Assistant in Surgery
*HENRY L. RIGDON.....	Assistant in Surgery
*OLIVER A. JAMES.....	Assistant in Surgery
ROBERT D. DUNCAN.....	Assistant in Surgery
*JOHN F. SCHAEFER.....	Assistant in Surgery
*HOWARD F. KINNAMON, JR.....	Assistant in Surgery

Instruction is given by means of lectures, laboratory work, recitations, dispensary work, bedside instruction, ward classes, and clinics. The work begins in the second year and continues throughout the third and fourth years.

The teaching is done in the anatomical laboratory, operative surgery laboratory, the dispensaries, wards, clinical laboratories and operating rooms of the University and Mercy Hospitals, and in the wards and operating rooms of the Baltimore City Hospitals.

## SECOND YEAR

TOPOGRAPHIC AND SURGICAL ANATOMY. The course is designed to bridge the gap between anatomy in the abstract and clinical anatomy as applied to the study and practice of medicine and surgery.

The teaching is done in the anatomical laboratory, and students are required



to demonstrate all points, outlines, and regions on the cadaver. Underlying regions are dissected to bring out outlines and relations of structures.

Two lectures and two laboratory periods per week during the second semester. Drs. Brantigan, Covington, Settle and Walker.

Total hours: 96.

**PRINCIPLES OF SURGERY.** This course includes history-taking, records of physical examinations and of operations and progress notes; the preparation of surgical dressings, suture materials and solutions. It includes inflammation, infections, ulcers, gangrene, fistulae and sinuses, hemorrhage, shock and tumors. Lectures and conferences, two hours per week for one semester, are given to the whole class. Dr. Aycock.

### THIRD YEAR

**GENERAL AND REGIONAL SURGERY.** Lectures, recitations and clinics on the principles of surgery and general surgery are given three hours a week to the whole class. Dr. C. R. Edwards.

The class is divided into groups and receives instruction in history-taking and surgical pathology under the supervision of Dr. Kindell, Chief of the Pathologic Department of the Baltimore City Hospitals. Instruction is also given in surgical diagnosis and in general surgery at the bedside and in the classroom at this institution by Drs. Aycock, C. A. Reifschneider, Brantigan and Adams. Two hours per week are given in orthopedic surgery by Dr. Voshell, chief of the orthopaedic service of this institution.

**OPERATIVE SURGERY.** Two courses are given in operative surgery under the supervision of Dr. Peake assisted by Drs. Chenowith, Deckert, Govatos, Healy, Karns, W. R. Johnson and Hyman. The class is divided into sections and each section is given practical and individual work under the supervision of the instructors.

**FRACTURES AND DISLOCATIONS.** This course consists of instruction in the various forms of fractures, dislocations and their treatment. There is a regular schedule of didactic lectures, which is supplemented by practical demonstrations in diagnosis and treatment.

**SURGICAL DISPENSARY.** Under supervision, the student takes the history, makes the physical examinations, attempts the diagnosis, and, as far as possible, carries out the treatment of the ambulatory surgical patients in the University and in the Mercy Hospitals. Mercy Hospital—Dr. Helfrich assisted by the whole dispensary staff. University Hospital—Drs. Little and Settle assisted by the whole dispensary staff.

### FOURTH YEAR

**CLINICS.** A weekly clinic is given at the Mercy and at the University Hospitals to one-half the class throughout the year. As far as possible this is a diagnostic clinic. Mercy Hospital—Dr. Hutchins. University Hospital—Dr. Shipley.

**SURGICAL PATHOLOGY.** A weekly exercise of one hour at Mercy Hospital for one semester at which specimens from the operating room and museum are studied in the gross and microscopically in relation to the case history. Dr. Bongardt.

**TRAUMATIC SURGERY.** This course deals with operative and post-operative treatment of accident cases, with instructions as to the relationship between the state, the employee, the employer, and the physician's duty to each. One hour a week to sections of the class throughout the year. Dr. Edmunds.

**CLINICAL CLERKSHIP.** This work includes the personal study of assigned hospital patients, under supervision of the staffs of the University and Mercy Hospitals, history-taking, and physical examination of patients, laboratory examinations, attendance at operations and observation of post-operative treatment.

**WARD CLASSES.** Ward-class instruction in small groups will consist of ward rounds, surgical diagnosis, treatment and the after-care of operative cases. Mercy Hospital—Drs. Hutchins, Blake, Bongardt, Nelson, Marvel, Maxson, and Jennings. University Hospital—Drs. Shipley, Charles Reid Edwards, Aycock, Adams and Brantigan.

### ANAESTHESIA

E. HOLLISTER DAVIS.....	Assistant in Anaesthesia
MARY J. O'BRIEN.....	Anaesthetist
RUTH ELLIOTT.....	Anaesthetist

### THIRD YEAR

Lectures are given on the general physiology of anaesthesia, with consideration of special physiology of each anaesthetic agent; methods of induction and administration of anaesthesia; factors influencing the selection of the anaesthetic and types of anaesthetic agents and the preparation and care of the anaesthetized patient.

The lectures are correlated with practical demonstrations during operative clinics at the Baltimore City Hospitals.

### FOURTH YEAR

During operative clinics in both surgery and gynecology each student will be given practical instruction in the administration of anaesthetics and will be required to record such changes as take place in blood pressure, pulse and respiration.

### DERMATOLOGY

HARRY M. ROBINSON, SR.....	Professor of Dermatology
FRANCIS A. ELLIS.....	Assistant Professor of Dermatology
JOHN R. ABERCROMBIE.....	Associate in Dermatology
★HARRY M. ROBINSON, JR.....	Associate in Dermatology
N. M. KANOF.....	Associate in Dermatology
★LESTER N. KOLMAN.....	Instructor in Dermatology
LUCILE J. CALDWELL.....	Instructor in Dermatology
ROLLIN C. HUDSON.....	Assistant in Dermatology
★MARK HOLLANDER.....	Assistant in Dermatology
★BENJAMIN HIGHSTEIN.....	Assistant in Dermatology
★SOLOMON TANENBAUM.....	Assistant in Dermatology

A weekly clinic is given at University Hospital throughout the year. This course consists of demonstrations of the common diseases of the skin, and conferences, in addition to a number of lectures on the general principles of dermatology. Drs. Robinson and Ellis.

Dispensary instruction is given in the diagnosis and treatment of skin diseases at the University Hospital by Dr. Robinson and dispensary staff, and at Mercy Hospital by Dr. Ellis and dispensary staff.

Third year.....	15 hours
Fourth Year.....	49 hours
Total.....	64 hours

### ORTHOPAEDIC SURGERY

ALLEN FISKE VOSHELL.....	Professor of Orthopaedic Surgery
ALBERTUS COTTON.....	Professor of Orthopaedic Surgery
COMPTON RIELY.....	Clinical Professor of Orthopaedic Surgery
MOSES GELLMAN.....	Associate Professor of Orthopaedic Surgery
HARRY L. ROGERS.....	Associate Professor of Orthopaedic Surgery
*HENRY F. ULLRICH.....	Associate Professor of Orthopaedic Surgery
I. H. MASERITZ.....	Instructor in Orthopaedic Surgery
JOHN V. HOPKINS.....	Assistant in Orthopaedic Surgery
JASON H. GASKELL.....	Assistant in Orthopaedic Surgery
*WILLIAM B. LONG, JR.....	Assistant in Orthopaedic Surgery

Didactic, clinical, bedside and out-patient instruction is given to the fourth year at the University and Mercy Hospitals and Dispensaries, Kernan Hospital for Crippled Children at Dickeyville and Baltimore City Hospitals. Instruction is also given to the third year in small groups at the Baltimore City Hospitals.

Weekly lectures throughout the year present all phases of orthopaedic surgery except fractures; brief discussions and demonstrations of physical therapy are included.

Fourth year groups are given more intimate instruction biweekly at one of the above institutions; fracture cases are included here.

Third year.....	60 hours
Fourth year.....	90 hours
Total.....	150 hours

### RHINOLOGY AND LARYNGOLOGY

EDWARD A. LOOPER.....	Professor of Rhinology and Laryngology
WAITMAN F. ZINN.....	Clinical Professor of Rhinology and Laryngology
FRANKLIN B. ANDERSON.....	Associate Professor of Rhinology and Laryngology
W. RAYMOND MCKENZIE.....	Associate in Rhinology and Laryngology
THOMAS R. O'ROURK.....	Associate in Rhinology and Laryngology
CLEO D. STILES.....	Associate in Rhinology and Laryngology
BENJAMIN S. RICH.....	Associate in Rhinology and Laryngology
F. A. KAYSER.....	Assistant in Rhinology and Laryngology
*THEODORE A. SCHWARTZ.....	Assistant in Rhinology and Laryngology

★WILLIAM C. HUMPHRIES.....	Assistant in Rhinology and Laryngology
FREDERICK T. KYPER.....	Assistant in Rhinology and Laryngology
SAMUEL L. FOX.....	Assistant in Rhinology and Laryngology
JOHN H. HIRSCHFELD.....	Assistant in Rhinology and Laryngology

*Third Year.* Instruction to whole class is given in the common diseases of the nose and throat, attention being especially directed to infections of the accessory sinuses, the importance of focal infections in the etiology of general diseases and modern methods of diagnosis. Lectures illustrated by lantern slides are given one hour weekly for seven weeks by Dr. Looper.

*Fourth Year.* Dispensary instruction is given for one and one-half hours daily, to small sections at the University and the Mercy Hospitals. The student is afforded an opportunity to study, diagnose and treat patients under supervision. Ward classes and clinical demonstrations are given in periods of one and one-half hours weekly throughout the session in the University and the Mercy Hospitals.

The Looper Clinic for bronchoscopy and esophagoscopy, recently established in the University Hospital, affords unusual opportunities for students to study diseases of the larynx, bronchi and esophagus. The clinic is open to students daily from 2 to 4 P.M. under direction of Dr. Looper.

The Mercy Hospital clinic for bronchoscopy and esophagoscopy is under the direction of Dr. Zinn. In these two clinics the etiology, symptomatology, diagnosis and treatment of foreign bodies in the air and food passages, as well as bronchoscopy, are taught to students as an aid in the diagnosis and treatment of diseases of the lungs.

Third year.....	9 hours
Fourth year.....	53 hours
Total.....	62 hours

#### GENITO-URINARY SURGERY

W. HOUSTON TOULSON.....	Professor of Genito-Urinary Surgery
KENNETH D. LEGGE.....	Clinical Professor of Genito-Urinary Surgery
AUSTIN H. WOOD.....	Associate in Genito-Urinary Surgery
L. J. MILLAN.....	Associate in Genito-Urinary Surgery
L. K. FARGO.....	Associate in Genito-Urinary Surgery
JOHN F. HOGAN.....	Associate in Genito-Urinary Surgery
W. A. H. COUNCILL.....	Associate in Genito-Urinary Surgery
★HARRY S. SHELLEY.....	Associate in Genito-Urinary Surgery
FRANCIS W. GILLIS.....	Associate in Genito-Urinary Surgery
★SAMUEL T. HELMS.....	Instructor in Genito-Urinary Surgery
★HOWARD B. MAYS.....	Instructor in Genito-Urinary Surgery
★HUGH JEWETT.....	Assistant in Genito-Urinary Surgery
MORRIS A. FINE.....	Assistant in Genito-Urinary Surgery

*Third Year.* This course is given for seven hours to the whole class. It consists of lectures and demonstrations, including the use of lantern slides and motion pictures. Dr. Toulson.

*Fourth Year.* The course in this year includes explanations and demonstrations



of urethroscopy, cystoscopy, ureteral catheterization, renal function tests, urography, urine cultures and the various laboratory procedures. The teaching consists of clinics and ward rounds to small groups, and attendance by members of the senior class upon the out-patients in the dispensary. The student here is placed much on his own responsibility in arriving at a diagnosis. Members of the staff are in constant attendance for consultations. These dispensary classes are conducted at both the Mercy and University Hospitals where practically every variety of urogenital disease is seen and used for teaching purposes.

Third year.....	8 hours
Fourth year.....	64 hours
Total.....	72 hours

### DISEASES OF THE RECTUM AND COLON

CHARLES F. BLAKE.....	Professor of Diseases of the Rectum and Colon
★MONTE EDWARDS.....	Clinical Professor of Diseases of the Rectum and Colon
THURSTON R. ADAMS.....	Associate in Diseases of the Rectum and Colon

*Third Year.* Seven lectures are given to the whole class. This course is for instruction in the diseases of the colon, sigmoid flexure, rectum and anus, and covers the essential features of the anatomy and physiology of the large intestine as well as the various diseases to which it is subject. Dr. Adams.

*Fourth Year.* Ward and dispensary instruction is given in the University and Mercy Hospitals, where different phases of the various diseases are taught by direct observation and examination. The use of the proctoscope and sigmoidoscope in the examination of the rectum and sigmoid is made familiar to each student. Mercy Hospital—Dr. Blake. University Hospital—Dr. Adams.

Third year.....	7 hours
Fourth year.....	16 hours
Total.....	23 hours

### OTOLOGY

THOMAS R. O'ROURK.....	Clinical Professor of Otology
FRANKLIN B. ANDERSON.....	Associate Professor of Otology
BENJAMIN S. RICH.....	Associate in Otology
★WILLIAM A. PARR.....	Assistant in Otology
CLEO D. STILES.....	Assistant in Otology
RICHARD S. OWENS.....	Assistant in Otology

The course in otology is planned to give a practical knowledge of the anatomy and physiology of the ear, and its proximity and relationship to the brain and other vital structures. The inflammatory diseases, their etiology, diagnosis, treatment and complications are particularly stressed, with emphasis upon their relationship to the diseases of children, head-surgery and neurology.

*Third Year.* The whole class is given instruction by means of talks, anatomical specimens and lantern slides.

*Fourth Year.* Small sections of the class receive instruction and make personal

examinations of patients under the direction of an instructor. The student is urged to make a routine examination of the ear in his ward work in general medicine and surgery.

Third year.....	12 hours
Fourth year.....	40 hours
Total.....	52 hours

#### NEUROLOGICAL SURGERY

CHARLES BAGLEY, JR.....	Professor of Neurological Surgery
RICHARD G. COBLENTZ.....	Clinical Professor of Neurological Surgery
JAMES G. ARNOLD, JR.....	Associate in Neurological Surgery
★WILLIAM W. MCKINNEY.....	Assistant in Neurological Surgery
JOHN A. WAGNER.....	Hitchcock Fellow in Neurological Surgery

*Third Year.* The course covers instruction in diagnosis and treatment of surgical conditions of the brain, spinal cord and the peripheral nerves. Drs. Bagley, Coblentz and Arnold.

*Fourth Year.* Weekly ward rounds and conferences are given at the University Hospital. Drs. Bagley, Coblentz and Arnold.

Third year.....	12 hours
Fourth year.....	30 hours
Total.....	42 hours

#### ONCOLOGY

J. MASON HUNDLEY, JR.....	Professor of Gynecology
GRANT E. WARD.....	Associate Professor of Surgery
BEVERLEY C. COMPTON.....	Associate in Gynecology
JOHN C. DUMLER.....	Associate in Gynecology
★MURRAY M. COPELAND.....	Associate in Surgery
E. EUGENE COVINGTON.....	Associate in Surgery
J. DUER MOORES.....	Instructor in Surgery
★ERNEST I. CORNBROOKS, JR.....	Instructor in Gynecology
★ARTHUR G. SIWINSKI.....	Instructor in Surgery
WILLIAM K. DIEHL.....	Instructor in Gynecology
★EVERETT S. DIGGS.....	Assistant in Gynecology

Every facility for the diagnosis and treatment of neoplastic diseases is available; this includes electro-surgery, radium therapy and deep X-ray therapy.

An out-patient clinic is held twice weekly which affords an opportunity for instruction to a limited number of students. The gynecological problems are under the supervision of Dr. Hundley, and the general surgical conditions are under the direction of Dr. Ward.

Instruction, other than dispensary teaching, is given to small groups of students, for one hour a week, in the history, physics and practical application of radium. Drs. Ward and Hundley.

Third year.....	8 hours
Fourth year.....	16 hours
Total.....	24 hours

## ORAL SURGERY

*BRICE M. DORSEY.....	Professor of Oral Surgery
CHARLES A. REIFSCHNEIDER.....	Clinical Professor of Oral Surgery
GRANT E. WARD.....	Associate Professor of Oral Surgery
WILLIAM E. HAHN.....	Associate Professor of Oral Surgery
VERNON D. KAUFMAN.....	Associate Professor of Oral Surgery
J. HERBERT WILKERSON.....	Assistant Professor of Oral Surgery
*HERBERT E. REIFSCHNEIDER.....	Instructor in Oral Surgery
CONRAD L. INMAN.....	Instructor in Oral Surgery
*B. WALLACE INMAN.....	Instructor in Oral Surgery
DORSEY R. TIPTON.....	Instructor in Oral Surgery

This section in the Department of Surgery is established for the teaching of both medical and dental students. A new subdivision in the dispensary has also been established. Beds will be provided in the University Hospital for the care of patients who will be available for the teaching of students from both schools.

Senior year: clinics weekly.

Ward instruction and group teaching are given. This includes diagnosis and treatment of diseases of the face, mouth and jaws.

## INDUSTRIAL MEDICINE AND SURGERY

PAGE EDMUNDS.....	Professor of Traumatic Surgery
G. CARROLL LOCKARD.....	Professor of Clinical Medicine
CHARLES A. REIFSCHNEIDER.....	Clinical Professor of Traumatic Surgery
THURSTON R. ADAMS.....	Associate in Surgery

This section is under the combined supervision of the medical and surgical departments. It is a cooperative effort by members of the medical school and hospital staff to afford means for clinical and laboratory study of the patient who has been subjected to traumatic or medical industrial hazard, so that adequate care may be instituted to promote his physical well-being. The facilities of the laboratories of the medical school and hospital are available as required.

Under direction of this department limited undergraduate instruction is given, especially in the methods of examination and of keeping records and in the general medico-legal principles as they affect the industrial employee, the employer, the general insurers, the physician and the hospital. There is also instruction on methods of making life insurance and other physical examinations, whether for employment or for health purposes. The wards of the University, Mercy and Baltimore City Hospitals provide for bed-side instruction.

Total hours: 48.

## FIRST AID INSTRUCTION

This course was added to the curriculum in 1942. Instruction consists of lectures combined with practical demonstrations and actual practice by students for two (2) hours every week for ten (10) weeks during the second semester of the Freshman Year.

## PLASTIC SURGERY

EDWARD A. KITLOWSKI.....Associate Professor of Plastic Surgery

This course is designed to acquaint students with the problems of reconstructive and plastic surgery. A subdivision in the dispensary has been established and beds for patients will be available for instruction in this course at the University and Baltimore City Hospitals and Kernan's Hospital for Crippled Children.

*Third Year.* Five lectures are given to the whole class. Dispensary instruction is provided on Mondays and Fridays.

*Fourth Year.* Ward rounds and operative demonstrations are held at the hospitals.

## DEPARTMENT OF OBSTETRICS

LOUIS H. DOUGLASS.....	Professor of Obstetrics
J. MCFARLAND BERGLAND.....	Associate Professor of Obstetrics
EMIL NOVAK.....	Associate Professor of Obstetrics
J. G. M. REESE.....	Assistant Professor of Obstetrics
M. ALEXANDER NOVEY.....	Assistant Professor of Obstetrics
ISADORE A. SIEGEL.....	Assistant Professor of Obstetrics
*JOHN E. SAVAGE.....	Associate in Obstetrics
MARGARET B. BALLARD.....	Associate in Obstetrics
DUDLEY P. BOWE.....	Associate in Obstetrics
*FRANK K. MORRIS.....	Instructor in Obstetrics
HUGH B. McNALLY.....	Instructor in Obstetrics
*KENNETH B. BOYD.....	Assistant in Obstetrics
W. ALLEN DECKERT.....	Assistant in Obstetrics
*JAROSLAV HULLA.....	Assistant in Obstetrics
MARIUS P. JOHNSON.....	Assistant in Obstetrics
MAXWELL L. MAZER.....	Assistant in Obstetrics
*FERD. E. KADAN.....	Assistant in Obstetrics
J. EDWARD NORRIS.....	Assistant in Obstetrics
*JACOB R. JENSEN.....	Assistant in Obstetrics
*J. WARREN ALBRITAIN.....	Assistant in Obstetrics
D. McCLELLEN DIXON.....	Assistant in Obstetrics
*W. KENNETH MANSFIELD, JR.....	Assistant in Obstetrics
BERNARD W. DONOHUE.....	Assistant in Obstetrics
*GEORGE H. DAVIS.....	Assistant in Obstetrics
*DANIEL I. DANN.....	Assistant in Obstetrics
CHARLES H. DOELLER, JR.....	Assistant in Obstetrics
*J. KING B. E. SEEGAR, JR.....	Assistant in Obstetrics
D. FRANK KALTREIDER.....	Assistant in Obstetrics
*L. CALVIN GAREIS.....	Assistant in Obstetrics
*SCHUYLER G. KOHN.....	Assistant in Obstetrics
*JOHN H. MORRISON.....	Assistant in Obstetrics
THOMAS B. DUNNE.....	Assistant in Obstetrics
ALMA BRAUN.....	Assistant in Obstetrics
H. C. DONAHOO, JR.....	Assistant in Obstetrics

*Third Year.* The lectures and recitations consisting of three hours' teaching weekly are designed to cover the anatomy of the female generative tract and the bony pelvis, the physiology and development of the ovum, and the physiology of



pregnancy and labor. Following this the pathology of pregnancy, labor and the puerperium are taken up. Drs. Douglass, Novak, Reese, Novey, Siegel and Kaltreider.

Each student spends time during his junior year at the Baltimore City Hospitals observing, assisting and finally delivering patients under strict supervision. Each student sees about twenty deliveries there, and does a considerable amount of the routine work.

The junior students are assigned as assistants to the seniors in the home delivery service and accompany them on deliveries.

Each student receives, in small groups, ten hours of instruction in palpation of patients and mensuration of the pelvis and demonstrations of the mechanism of labor. Drs. Siegel and McNally.

*Fourth Year.* At the weekly clinical conference, cases are presented and discussed and the student body is encouraged to offer opinions and to ask questions. There is no didactic teaching done, and an earnest effort is made to keep it, in every sense of the word, a conference. Dr. Douglass.

The ward classes are held twice weekly for five weeks for each group. Various subjects are assigned and discussed, patients and their histories are presented. Drs. Reese, Novey and McNally.

Manikin instruction is given once a week. Drs. Dixon, Doeller and Kaltreider.

During the same five-week period, the students are sent into patients' homes to conduct deliveries under supervision of a senior member of the house staff and with the assistance of a graduate nurse. The student is held responsible for the complete conduct of each assigned case.

Each student spends thirty hours in the prenatal clinic, taking histories and examining patients under supervision.

Finally, the students are invited to attend the monthly meetings of The Committee on Maternal Mortality, where all maternal deaths occurring in Baltimore are openly discussed. *Hours*—Third year—148; Fourth year—102; total—250.

#### DEPARTMENT OF GYNECOLOGY

J. MASON HUNDLEY, JR.....	Professor of Gynecology
THOMAS K. GALVIN.....	Clinical Professor of Gynecology
LEO BRADY.....	Assistant Professor of Gynecology
GEORGE A. STRAUSS, JR.....	Assistant Professor of Gynecology
EDWARD P. SMITH.....	Assistant Professor of Gynecology
JOHN T. HIBBITTS.....	Associate in Gynecology
★KENNETH B. BOYD.....	Associate in Gynecology
JOHN C. DUMLER.....	Associate in Gynecology
BEVERLEY C. COMPTON.....	Associate in Gynecology
HOUSTON EVERETT.....	Associate in Gynecology
J. J. ERWIN.....	Associate in Gynecology
THOMAS S. BOWYER.....	Instructor in Gynecology
ERNEST S. EDLOW.....	Instructor in Gynecology
W. ALLEN DECKERT.....	Instructor in Gynecology
★FRANK K. MORRIS.....	Instructor in Gynecology
★ERNEST I. CORNBROOKS, JR.....	Instructor in Gynecology
WILLIAM B. SETTLE.....	Instructor in Gynecology

WILLIAM K. DIEHL .....	Instructor in Gynecology
★H. L. GRANOFF .....	Assistant in Gynecology
HELEN I. MAGINNIS .....	Assistant in Gynecology
★EVERETT S. DIGGS .....	Assistant in Gynecology
★ROLAND E. BIEREN .....	Assistant in Gynecology
THOMAS L. WILSON .....	Assistant in Gynecology

*Third Year.* A course of thirty lectures and recitations is given to the whole class. In addition, a short course of lecture-demonstrations is given at the Baltimore City Hospitals, consisting of eight periods of one hour each, in which small groups of students are instructed in the fundamentals of gynecological diagnosis and examination.

*Fourth Year.* Operative clinics—lectures and demonstrations—are given six hours per week, for five weeks, to sections of the class.

Instruction in female urology is given. A small number of students may attend the cystoscopic dispensary which is held twice weekly.

The course in gynecology also includes instruction in the diagnosis and treatment of cancer of the generative organs. Small groups of students attend the oncological dispensary for additional work.

Third year .....	38 hours
Fourth year .....	<u>74 hours</u>
Total .....	112 hours

#### DEPARTMENT OF OPHTHALMOLOGY

CLYDE A. CLAPP .....	Professor of Ophthalmology
M. RANDOLPH KAHN .....	Clinical Professor of Ophthalmology
H. K. FLECK .....	Clinical Professor of Ophthalmology
HENRY F. GRAFF .....	Assistant Professor of Ophthalmology
JONAS FRIEDENWALD .....	Lecturer in Ophthalmic Pathology
JOSEPH I. KEMLER .....	Associate in Ophthalmology
F. EDWIN KNOWLES, JR. ....	Associate in Ophthalmology
★F. A. HOLDEN .....	Instructor in Ophthalmology
MILTON C. LANG .....	Instructor in Ophthalmology
★A. KREMEN .....	Instructor in Ophthalmology
★JEROME SNYDER .....	Assistant in Ophthalmology
★MARION H. GILLIS .....	Assistant in Ophthalmology

*Third Year.* Second semester. Dr. Kahn reviews the anatomy and physiology of the eye and discusses the methods used in making the various examinations. Errors of refraction and their effect upon the general system are explained. Weekly section work, demonstrating the use of the ophthalmoscope, is carried on during the entire session.

*Fourth Year.* Clinics and demonstrations are given in diseases of the eye, weekly, for one year. Dr. Clapp.

This course consists of lectures upon the diseases of the eye, with particular reference to their diagnosis and relation to general medicine. Special lectures will be given upon vascular changes in the eye and upon the pathology of the eye. Some operations will be demonstrated by motion pictures.

Weekly ward classes are held at the University, The Baltimore Eye, Ear and Throat and Mercy Hospitals during which the eye grounds in the various medical and surgical conditions are demonstrated. Also daily demonstrations are given in the taking of histories and the diagnosis and treatment of the various conditions as seen in the dispensary. Drs. Fleck, Kemler, Graff and Knowles.

Third year.....	20 hours
Fourth year.....	104 hours
Total.....	124 hours

#### DEPARTMENT OF ROENTGENOLOGY

HENRY J. WALTON.....	Professor of Roentgenology
★WALTER L. KILBY.....	Acting Professor of Roentgenology
ALBERTUS COTTON.....	Professor of Roentgenology
CHARLES N. DAVIDSON.....	Assistant Professor of Roentgenology
DONALD J. BARNETT.....	Assistant in Roentgenology

During the academic year small groups of the fourth year class are given weekly instruction in the diagnostic and therapeutic uses of the Roentgen rays. An effort is made to familiarize the student with the indications for and limitations of Roentgen ray examinations. The history, physics and practical application of Roentgen rays are alluded to but not stressed. Conferences are held with the various departments during the school year which are also open to members of the fourth year class.

Total hours: 96.

#### HISTORY OF MEDICINE\*

★LOUIS A. M. KRAUSE.....	Associate Professor of Medicine
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Beginning with the spring of 1942 a group of lectures on the history of medicine has been presented on selected phases and trends of the development of medical knowledge and practice. It is planned to avoid duplication of subject matter for at least four years.

These lectures are offered primarily for our students, but a cordial invitation is extended to anyone who may wish to attend.

Announcement of the lectures will be made by mail and on the bulletin board of the School of Medicine.

#### ART AS APPLIED TO MEDICINE

★CARL DAME CLARKE.....	Associate Professor of Art as Applied to Medicine
AMELIA R. COHEN.....	Acting Director

This department is maintained for the purpose of supplying pictorial and plastic illustrations for visual teaching in the classrooms of the medical school and for publication in scientific periodicals.

Special courses of instruction are given to qualified students during peacetime.

\* These lectures have been suspended during the emergency.

# FIRST YEAR SCHEDULE

## FIRST SEMESTER, JANUARY 13 TO MAY 6, 1944

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 12.00	*Histology and Embryology 11-12 lecture <i>Bressler 2</i>			*Histology and Embryology 11-12 lecture <i>Bressler 2</i>		Gross Anatomy <i>Bressler 1</i>
12.00 to 1.00	Lunch					
1.00 to 5.00	Gross Anatomy Lecture and Laboratory <i>A. H. and Bressler 1</i>					

\* Course begins January 27.

## SECOND SEMESTER, MAY 15 TO SEPTEMBER 29, 1944

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 12.00	Laboratory — Biol. Chem. Sect. A	Laboratory — Biol. Chem. Sect. B	Laboratory —  Biol. Chem. Sect. A	Laboratory —  Biol. Chem. Sect. B	Lecture—9-10  Neuro-Anatomy <i>Bressler 2</i>	Lecture—9-10  Neuro-Anatomy <i>Bressler 2</i>
12.00 to 1.00	Transfer and Lunch	Transfer and Lunch	Lunch	Lunch	Lunch	
1.00 to 2.00			Biol. Chem. <i>Adm. 1</i>	Biol. Chem. <i>Adm. 1</i>	Biol. Chem. <i>Adm. 1</i>	
2.00 to 3.00			Biol. Chem. Conference <i>Adm. 1</i>		Biol. Chem. Conference <i>Adm. 1</i>	
3.00 to 5.00					(3-5) First Aid (Sections will be posted) May 19 to July 21	

### Locations of Lecture Halls and Laboratories:

Adm. 1—First Floor, Administration Building, Lombard and Greene Streets.  
A. H.—Anatomical Hall—Upper Hall, N. E. Cor. Lombard and Greene Streets.  
C. H.—Chemical Hall, Lower Hall, N. E. Cor. Lombard and Greene Streets.  
Biological Chemistry Laboratory—Third Floor, 31 South Greene Street.  
Bressler Research Laboratory—29 S. Greene Street.

Gross Anatomy—First Floor

Histology and Embryology—Second Floor.

Neuro-anatomy—Second Floor.

S-P—The Sheppard and Enoch Pratt Hospital, Towson. (Take car No. 8. Get off at Cedar Avenue. Fifteen-minute walk to main building.)

*Mid-Year Examinations—May 1-6, 1944*

*Final Examinations—September 18-23, 1944*



# SECOND YEAR SCHEDULE

## FIRST SEMESTER, JANUARY 13 TO MAY 6, 1944

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 9.30	Physiology <i>Bressler 2</i>	Physiology <i>Bressler 2</i>	Medicine <i>Bressler 2</i>	Physiology <i>Bressler 2</i>	Physiology <i>Bressler 2</i>	
9.30 to 10.30	Physiology Conference <i>Bressler 2</i>	Bacteriology  <i>Adm. 1</i>	Physiology  <i>Bressler 2</i>	Pharmacology  <i>Bressler 2</i>	Pharmacology  <i>Bressler 2</i>	
10.30 to 12.30	†Bacteriology  Laboratory				Psychiatry <i>C. H.</i> Neurological Diagnosis <i>C. H.</i>	
12.30	Lunch					
1.00 to 5.00	Pharm. Lect. (1-2) <i>Bressler 2</i> Pharmacology <i>B</i> Physiology <i>A</i>	Laboratory <i>A</i> Laboratory <i>B</i>	Elective	Pharmacology (1 to 4) <i>B</i> Physiology <i>A</i>	Laboratory <i>A</i> Laboratory <i>B</i>	

† Bacteriology Laboratory—Section work during the last month.

## SECOND SEMESTER, MAY 15 TO SEPTEMBER 29, 1944

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.30	Surgery <i>Bressler 2</i>	Surgery <i>Bressler 2</i>	Surgical Anatomy <i>Bressler 2</i>		Physical Diagnosis <i>Bressler 2</i> 4 lectures	
9.30 to 10.30	Pharmacology <i>Bressler 2</i>	Pharmacology <i>Bressler 2</i>	Surgical Anatomy Laboratory	9-10 Medical Clinic <i>Amp.</i>	Pharmacology <i>Bressler 2</i>	
10.30 to 11.30	Pathology <i>C. H.</i>	Pathology <i>C. H.</i>	<i>Bressler 1</i>	Pathology <i>C. H.</i>	Pathology <i>C. H.</i>	
11.30	Lunch					
12.00 to 2.00	Pathology Laboratory	Pathology Laboratory	Immunology	Pathology Laboratory	Pathology Laboratory	
2.00 to 3.00	Surgical Anatomy <i>Bressler 2</i>	Immunology	Laboratory	Pharmacology Laboratory <i>Sect. A</i> Physical Diagnosis <i>Sect. B</i> (3.00-5.00) <i>U. H. D.</i>	Pharmacology Laboratory <i>Sect. B</i> Physical Diagnosis <i>Sect. A</i> (3.00-5.00) <i>U. H. D.</i>	
3.00 to 5.00	Surgical Anatomy Laboratory <i>Bressler 1</i>	Laboratory	Optional period Pathology  Immunology			

|| Immunology Laboratory—Section work during last two months.

Locations of Lecture Halls and Laboratories:

Adm. 1—First floor, Administration Building, Lombard and Greene Streets.

C. H.—Chemical Hall, Lower Hall, Lombard and Greene Streets.

Amp.—Wilson Memorial Amphitheatre, New University Hospital, Greene and Redwood Streets, Eighth Floor.

U. H. D.—University Hospital Dispensary, Old Hospital Building.

Laboratories:

Physiology, Pharmacology, Surgical Anatomy—Bressler Building.

Bacteriology, Immunology, Pathology, Second Floor, 31 S. Greene Street.

*Mid-Year Examinations—May 1-6, 1944*

*Final Examinations—September 18-23, 1944*

### THIRD YEAR SCHEDULE JANUARY 13 TO SEPTEMBER 29, 1944

#### SCHEDULE 1

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.20	(Whole Class) Obstetrics <i>C. H.</i> †Gynecology July 24 to Sept. 4	(Whole Class) Surgery <i>C. H.</i>	(Whole Class) Obstetrics <i>C. H.</i> †Gynecology July 26 to Sept. 6	(Whole Class) Surgery <i>C. H.</i>	(Whole Class) Pathology <i>C. H.</i>	(Whole Class) Surgery <i>C. H.</i> †Gynecology May 20 to ‡July 8
9.20 to 10.00	Transfer to Baltimore City Hospitals					
10.00 to 12.00	Physical Diagnosis, Pathology, Neurology and Pediatrics at B. C. H.					
12.00 to 1.00	Transfer and Lunch	Transfer and Lunch	Lunch	Transfer and Lunch	Lunch	
1.00 to 2.00	(Whole Class) Proctology, Otolaryngology, Urology, Nose & Throat, Plastic Surgery <i>C. H.</i>	(Whole Class) *Gynecology †Eye—9 wks. May 16 to July 11 †Oncology —5 wks. July 18 to Sept. 5 <i>C. H.</i>	Medical  Clinic  <i>B. C. H.</i>	(Whole Class) Clinical Pathology  <i>Bressler 2</i>	Obstetrical  Clinic  <i>B. C. H.</i>	
2.00 to 4.00	(Whole Class) Pathology Laboratory <i>31</i>		Surgery (2.00 to 4.00) — Pediatrics (2.00 to 4.30) —	(Whole Class) Clinical Pathology	Surgery (2.00 to 4.00) — Pediatrics (2.00 to 4.30) —	
4.00 to 5.00	(Whole Class) Hygiene and Public Health <i>C. H.</i>	(Whole Class) Physical Diagnosis, Psychiatry, Legal Medicine <i>C. H.</i>	Gynecology Orthopaedics Psychiatry (Subgroups of Surgery Group) (4.00 to 5.00)	— Laboratory  <i>Bressler 5</i>	Gynecology Orthopaedics Psychiatry (Subgroups of Surgery Group) (4.00 to 5.00)	

\* First Semester.

† Second Semester.

‡ No classes after July 8.

# THIRD YEAR SCHEDULE

## JANUARY 13 TO SEPTEMBER 29, 1944

### SCHEDULE 2

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.20	Same as Schedule 1					
9.20 to 10.20	Pediatrics <i>C. H.</i>	Medicine <i>C. H.</i>	Medicine <i>C. H.</i>	Therapeutics <i>C. H.</i>	Medicine <i>C. H.</i>	Neurology <i>C. H.</i>
10.30 to 12.30	Operative Surgery— <i>Bressler 6</i> Medical and Surgical Dispensaries—(Univ. and Mercy Sections)					
12.30 to 1.00	Lunch					
1.00 to 2.00	Same as  Schedule 1		Medical Clinic <i>Amp.</i>	Same as  Schedule 1	Psychiatry (9 weeks) Dermatology (6 weeks) N.B.—The whole section reports to psychiatry for first three weeks, then subdivides.	
2.00 to 4.00			Ophthalmoscopy (5 weeks) <i>B. E. H.</i> — Obstetrics (5 weeks) Univ. Hosp. Disp. — Otclogy (5 wks.) <i>Bressler 5</i> <i>Conf. Room</i>		<i>Br. 2</i> for first 3 wks. U. H. Disp. Last 12 wks.	
4.00 to 5.00					Obstetrics <i>Br. 2</i>	

The Junior Class will be divided into two sections—A and B. Each section reports to classes in keeping with the following schedule assignment, in which the letters represent the class sections and the numerals indicate the schedules to be followed for the 15-week periods shown.

#### Schedule Assignment

Periods	Sections and Schedules
Jan. 13 to Apr. 29, 1944.....	A-1, B-2
May 15 to Sept. 9, 1944.....	B-1, A-2

#### Locations of Lecture Halls, etc.

A. H.—Anatomical Hall, Upper Hall, N. E. Cor. Lombard and Greene Streets.  
Amp.—Wilson Memorial Amphitheatre, New University Hospital, Eighth Floor.  
B. C. H.—Baltimore City Hosps., 4940 Eastern Ave.  
B. E. H.—Baltimore Eye, Ear and Throat Hospital, 1214 Eutaw Place.  
Bressler—Bressler Building, 29 S. Greene Street.  
C. H.—Chemical Hall, Lower Hall, N. E. Cor. Lombard and Greene Streets.  
Univ. Hosp.—New University Hospital, Greene and Redwood Streets.  
U. H. Disp.—Old Hospital Building, S. W. Cor. Lombard and Greene Streets.  
31—31 South Greene Street.  
Clinical Pathology Laboratory—Fifth Floor, Bressler Building.  
Pathology Laboratory—31 South Greene Street, Special Rooms, Basement.

Mid-Year Examinations—May 1-6, 1944

Final Examinations—September 11-23, 1944

# FOURTH YEAR SCHEDULE

## JANUARY 13 TO SEPTEMBER 29, 1944

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Ward Classes	Ward Classes	Ward Classes	Ward Classes	Ward Classes	Ward Classes
9.00 to 11.00	(a) Medicine (b) Surgery (c) Obstetrics (d) Pediatrics	(a) Medicine (a) Surgery (b) Gynecology (c) Gynecology	(a) Medicine (a) Surgery (b) Obstetrics (d) Pediatrics	(a) Medicine (a) Surgery (b) Gynecology (c) Gynecology	(a) Medicine (a) Surgery (b) Obstetrics (d) Pediatrics	(a) Medicine (a) Surgery (b) Gynecology (d) Pediatrics
11.00 to 12.00	Orthopaedic Surgery  <i>Univ. Sec. Amp. P. &amp; S. Sec. 51</i>	Medical Clinic <i>Univ. Sec. Amp.</i>  Surgical Pathology <i>P. &amp; S. Sec. 40</i>	Clinical Pathological Conference  <i>Univ. Sec. Amp. P. &amp; S. Sec. 34</i>	Surgical Clinic  <i>Univ. Sec. Amp. P. &amp; S. Sec. 51</i>	Medical Clinic  <i>Univ. Sec. Amp. P. &amp; S. Sec. 34</i>	Pediatric Clinic  <i>Univ. Sec. Amp. P. &amp; S. Sec. 34</i>
12.00 to 2.00	Dispensary, Lunch	Dispensary, Lunch	Dispensary, Lunch	Dispensary, Lunch	Dispensary, Lunch	Dispensary
2.15 to 3.15	Dermatology Clinic 1st time Full Class <i>Amp. then divide</i>  <i>Univ. Sec. { Disp.                   { Amp.                   P. &amp; S. Sec. 34</i>	Neurology Clinic  <i>Univ. Sec. Amp. P. &amp; S. Sec. 34</i>	Eye and Ear Clinic  (Full Class at Univ. Hosp.)  <i>Amp.</i>	Obstetrical Clinic  (Full Class at Univ. Hosp.)  <i>Amp.</i>	Hygiene and Public Health Jan. 14 to Feb. 18  Tropical Medicine Feb. 25  (Full Class at Univ. Hosp.)  <i>Amp.</i>	
3.30 to 5.00	<i>P. &amp; S. Sect. and Univ. Sect. Ward Classes</i>	<i>P. &amp; S. Sect. Ward Classes</i>  Medicine  Orthopaedics  Pediatrics  <i>Univ. Sect. Ward Classes</i>  Medicine  Proctology  Oncology (3.30-4.30) <i>Amp.</i>	<i>P. &amp; S. Sect. Ward Classes</i>   Nose and Throat   <i>Univ. Sect. Ward Classes</i>   Urology <i>Amp.</i>  Eye and Ear	<i>P. &amp; S. Sect. Ward Classes</i>  Medicine  Proctology  Pediatrics  <i>Univ. Sect. Ward Classes</i>  Therapeutics	<i>P. &amp; S. Sect. Ward Classes</i>  Neurology  Roentgenology  Psychiatry <i>Amp.</i>  <i>Univ. Sect. Ward Classes</i>  Neurology  Orthopaedic Surgery (Kernan Hospital)  Psychiatry <i>Amp.</i>	Medical Section  Surgical "  Special "   Medical Section  Surgical "  Special "

(a)—Univ. and P. &amp; S. Sections.

(b)—Univ. Section.

(c)—Whole P. &amp; S. special group.

(d)—P. &amp; S. special group, divided attendance at Univ. and P. &amp; S.

The Senior Class is divided into two sections, which report, one at Lombard and Greene Streets, the other at Calvert and Saratoga Streets for one semester each, then rotate.

Each section of the class is divided into three groups—Medical, Surgical, and Special. These groups will rotate on the following dates:

*First Semester*

1st period..... Jan. 13-Feb. 16  
2nd period..... Feb. 17-Mar. 23  
3rd period..... Mar. 24-Apr. 29

*Second Semester*

1st period..... May 15-June 15  
2nd period..... June 16-July 18  
3rd period..... July 19-Sept. 9

C. H.—Chemical Hall—N. E. Cor. Lombard and Greene Streets.

Amp.—Wilson Memorial Amphitheatre—New University Hospital.

Disp. Amp.—Old Hospital Building, fourth floor S. W. cor. Lombard and Greene Streets.

P. &amp; S., 34—Second floor, Calvert and Saratoga Streets.

P. &amp; S., 40, 51—Fourth floor, Calvert and Saratoga Streets.

Univ. Section Dispensary schedule posted in Old Hospital Bldg.

P. &amp; S. Section—obtain special schedule at Mercy Hospital

Mid-Year Examinations—May 1-6, 1944

Final Examinations—September 11-16, 1944



# UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND COLLEGE OF PHYSICIANS AND SURGEONS

## GRADUATES, DECEMBER 23, 1943

- Acton, Elizabeth, A.B. . . . . New Jersey  
 Baldwin, Ruth Workman . . . . . Illinois  
 Ballard, William Riley, Jr., A.B. . . . . West Virginia  
 Bennett, Lillian Feykert, A.B., M.A. . . . . California  
 Berry, Herbert Lee . . . . . Arizona  
 Bitsack, Joseph William, A.B. . . . . New Jersey  
 Brandt, Frederick Bertram . . . . . District of Columbia  
 Brobst, Henry Thomas, A.B. . . . . Pennsylvania  
 Brown, Charles William, A.B. . . . . Pennsylvania  
 Brown, James Mack, A.B. . . . . Alabama  
 Colon-Yordan, Ernesto, A.B. . . . . Puerto Rico  
 Cook, Elmer Ellsworth, Jr. . . . . Maryland  
 Corpening, William Nye, A.B. . . . . North Carolina  
 Crosby, Robert MacGonigle Nelson . . . . . Maryland  
 Curtiss, Robert Kimber, A.B. . . . . New York  
 Dann, Alfred Henry, A.B. . . . . Maryland  
 Day, Edward Colson, A.B. . . . . New York  
 Dillon, Harold, B.S. . . . . Maryland  
 Dorman, Hamilton Peacock, B.S. . . . . District of Columbia  
 Doyle, John Justin, B.S. . . . . Massachusetts  
 Ehrlich, Daniel, A.B. . . . . Maryland  
 Ferri, Henry Guy, B.S. . . . . Pennsylvania  
 Finegold, Aaron Nathan, B.S. . . . . Pennsylvania  
 Foley, Mary Jane, A.B. . . . . West Virginia  
 Frye, Augustus Homer, Jr., B.S. . . . . Georgia  
 Galitz, Eli, A.B. . . . . New York  
 Garrett, Richard Mitchell . . . . . Alabama  
 Gubnitsky, Albert, B.S. . . . . Maryland  
 Guyther, Joseph Roy . . . . . Maryland  
 Harris, William Myrick . . . . . Maryland  
 Haight, John Stevenson . . . . . West Virginia  
 Hornbrook, Francis Eugene, A.B., B.S. . . . . West Virginia  
 Iguina-Jimeniz, Manuel Antonio, B.S. . . . . Puerto Rico  
 Ingenito, Gabriel Andrew, A.B. . . . . Connecticut  
 Ingram, Charles Hal, A.B. . . . . North Carolina  
 Isaels, Luis Manuel, B.S. . . . . Puerto Rico  
 Jaworski, Melvin Joseph, B.S. . . . . Maryland  
 Keeney, Dan Franklin . . . . . Maryland  
 Kemper, Charles Alexander, A.B. . . . . Maryland  
 Kinney, Earl Ray, A.B. . . . . West Virginia  
 Kirby, Ishmael Worth, B.S. . . . . North Carolina  
 Kleiman, Allen, A.B. . . . . Maryland  
 Latimer, Clarence Vinette, Jr., A.B. . . . . New York  
 Lurting, Frederick Wilbur, B.S. . . . . Pennsylvania  
 Mamula, Peter, A.B. . . . . West Virginia  
 Marks, Arnold Robert, A.B. . . . . West Virginia  
 McCormack, Lloyd Leo . . . . . New Jersey  
 McFadden, Robert Burns, B.S. . . . . Maryland  
 McGrath, William Edward, Jr., A.B. . . . . Maryland  
 McMullin, Joseph Frederick, A.B. . . . . Pennsylvania  
 Meade, DeVoe Kepler, B.S. . . . . Maryland  
 Miranda, Angel Neftali . . . . . Puerto Rico  
 Morgan, Jack Calvin, A.B. . . . . West Virginia  
 Myers, Myron Joseph, A.B. . . . . Maryland  
 Nelson, Alfred Turner . . . . . Maryland  
 Nesbitt, Isaac Floyd, B.S. . . . . North Carolina  
 Ozazewski, John Casimir, B.S. . . . . Maryland  
 Palese, John Michael . . . . . Maryland  
 Peters, Robert Joseph . . . . . Pennsylvania  
 Pfeil, Edgar Thornton . . . . . Maryland  
 Pinas, Samuel Ronald, B.S. . . . . Maryland  
 Pomeroy, William Henry, II, B.S. . . . . Connecticut  
 Raffucci-Arce, Francisco Luis . . . . . Puerto Rico  
 Range, James Jacob, A.B. . . . . Tennessee  
 Ratliff, Cliff, Jr., A.B. . . . . North Carolina  
 Ream, Norman, B.S. . . . . Pennsylvania  
 Recht, John Munn, A.B. . . . . New Jersey  
 Rinehart, Arthur Middleton, B.S. . . . . Maryland  
 Robertson, Merritt Ezekiel, A.B. . . . . North Carolina  
 Rogers, George Carraway, A.B. . . . . North Carolina  
 Rogers, William Brannon, Jr., B.S. . . . . Ohio  
 Santiago, Stevenson Parker, A.B. . . . . Puerto Rico  
 Sapareto, Rocco Louis, B.S. . . . . Massachusetts  
 Scherlis, Irving, A.B. . . . . Maryland  
 Shipley, Frank Mollman, A.B. . . . . Maryland  
 Shortle, James Samuel, B.S. . . . . New Mexico  
 Sones, Frank Mason, Jr., A.B. . . . . Maryland  
 Stegall, John Thomas, B.S. . . . . North Carolina  
 Sterling, Harold, B.S. . . . . District of Columbia  
 Strobel, Martin Edward, A.B. . . . . Maryland  
 Summerlin, Glenn Olson . . . . . Florida  
 Thompson, Talmadge Stanley . . . . . Maryland  
 Tilt, LeRoy Wortendyke, Jr., A.B. . . . . Maryland  
 Vargas, Dharma Luz, B.S. . . . . Puerto Rico  
 Waldrop, Grayson Spencer, A.B. . . . . North Carolina  
 Walkup, Harry Ernest . . . . . West Virginia  
 West, George Brooks, Jr., B.S. . . . . Virginia  
 Will, David Reid . . . . . Ohio  
 Williams, Thomas Richard, Jr., A.B. . . . . North Carolina  
 Ziegler, Paul Randall . . . . . Maryland

## HONORS

## UNIVERSITY PRIZE GOLD MEDAL

LILLIAN FEYKERT BENNETT

## CERTIFICATES OF HONOR

LEROY WORTENDYKE TILT, JR.

ERNESTO COLON-YORDAN

ARNOLD ROBERT MARKS

JOSEPH ROY GUYTHER

EDGAR THORNTON PFEIL

## INTERNSHIPS—GRADUATES OF DECEMBER 23, 1943

January 1, 1944—September 30, 1944

Acton, Elizabeth.....Baltimore City Hospitals, Baltimore, Md.  
 Baldwin, Ruth Workman.....West Baltimore General Hospital, Baltimore, Md.  
 Ballard, William Riley, Jr.....California Hospital, Los Angeles, Calif.  
 Bennett, Lillian Feykert.....Massachusetts General Hospital, Boston, Mass.  
 Berry, Herbert Lee.....San Diego County General Hospital, San Diego, Calif.  
 Bitsack, Joseph William.....St. Vincent's Hospital, New York, N. Y.  
 Brandt, Frederick Bertram.....Garfield Memorial Hospital, Washington, D. C.  
 Brobst, Henry Thomas.....Indiana University Medical Center, Indianapolis, Ind.  
 Brown, Charles William.....Western Pennsylvania Hospital, Pittsburgh, Pa.  
 Brown, James Mack.....Women's Hospital, Detroit, Mich.  
 Colon-Yordan, Ernesto.....Providence Hospital, Detroit, Mich.  
 Cook, Elmer Ellsworth.....Mercy Hospital, Baltimore, Md.  
 Corpening, William Nye.....University Hospital, Baltimore, Md.  
 Crosby, Robert MacGonigle Nelson.....Mercy Hospital, Baltimore, Md.  
 Curtiss, Robert Kimber.....Syracuse University Medical Center Hospitals, Syracuse, N. Y.  
 Dann, Alfred Henry.....Sinai Hospital, Baltimore, Md.  
 Day, Edward Colson.....Union Memorial Hospital, Baltimore, Md.  
 Dillon, Harold.....Sinai Hospital, Baltimore, Md.  
 Dorman, Hamilton Peacock.....Mercy Hospital, Pittsburgh, Pa.  
 Doyle, John Justin.....Worcester City Hospital, Worcester, Mass.  
 Ehrlich, Daniel.....Baltimore City Hospitals, Baltimore, Md.  
 Ferri, Henry Guy.....Medical Center, University of Pittsburgh, Pittsburgh, Pa.  
 Finegold, Aaron Nathan.....Montefiore Hospital, Pittsburgh, Pa.  
 Foley, Mary Jane.....Mercy Hospital, Baltimore, Md.  
 Frye, Augustus Homer, Jr.....St. Agnes Hospital, Baltimore, Md.  
 Galitz, Eli.....Coney Island Hospital, Brooklyn, N. Y.  
 Garrett, Richard Mitchell.....Methodist Hospital, Brooklyn, N. Y.  
 Gubnitsky, Albert.....Lincoln Hospital, New York, N. Y.  
 Guyther, Joseph Roy.....Mercy Hospital, Baltimore, Md.  
 Harris, William Myrick.....Presbyterian Hospital, Denver, Col.  
 Haight, John Stevenson.....University Hospital, Baltimore, Md.  
 Hornbrook, Francis Eugene.....Mercy Hospital, Baltimore, Md.  
 Iguaña-Jimenez, Manuel Antonio.....Bayamón Charity District Hospital, Bayamón, P. R.  
 Ingenito, Gabriel Andrew.....Grace Hospital, New Haven, Conn.  
 Ingram, Charles Hal.....University Hospital, Baltimore, Md.

Isales, Luis Manuel.....	Mercy Hospital, Pittsburgh, Pa.
<sup>1</sup> Jaworski, Melvin Joseph.....	University Hospital, Baltimore, Md.
Keeney, Dan Franklin.....	Garfield Memorial Hospital, Washington, D. C.
Kemper, Charles Alexander.....	University Hospital, Baltimore, Md.
Kinney, Earl Ray.....	Baltimore City Hospitals, Baltimore, Md.
Kirby, Ishmael Worth.....	Garfield Memorial Hospital, Washington, D. C.
Kleiman, Allen.....	Queens General Hospital, Jamaica, Long Island, N. Y.
Latimer, Clarence Vinette, Jr.....	University Hospital, Baltimore, Md.
Lurting, Frederick Wilbur.....	St. Joseph's Hospital, Baltimore, Md.
Mamula, Peter.....	St. Francis Hospital, Pittsburgh, Pa.
Marks, Arnold Robert.....	University Hospital, Baltimore, Md.
McCormack, Lloyd Leo.....	Maryland General Hospital, Baltimore, Md.
McFadden, Robert Burns.....	Mercy Hospital, Baltimore, Md.
McGrath, William Edward, Jr.....	St. Agnes Hospital, Baltimore, Md.
McMullin, Joseph Frederick.....	Washington Hospital, Washington, Pa.
Meade, DeVoe Kepler.....	Garfield Memorial Hospital, Washington, D. C.
Miranda, Angel Neftali.....	Hamot Hospital, Erie, Pa.
Morgan, Jack Calvin.....	Union Memorial Hospital, Baltimore, Md.
Myers, Myron Joseph.....	Sinai Hospital, Baltimore, Md.
Nelson, Alfred Turner.....	University Hospital, Baltimore, Md.
Nesbitt, Isaac Floyd.....	Medical College of Virginia, Hospital Division, Richmond, Va.
Ozazewski, John Casimir.....	Mercy Hospital, Baltimore, Md.
<sup>2</sup> Palese, John Michael.....	Mercy Hospital, Baltimore, Md.
Peters, Robert Joseph.....	Mercy Hospital, Pittsburgh, Pa.
Pfeil, Edgar Thornton.....	University Hospital, Baltimore, Md.
Pinas, Samuel Ronald.....	Sinai Hospital, Baltimore, Md.
Pomeroy, William Henry, II.....	Hartford Hospital, Hartford, Conn.
Raffucci-Arce, Francisco Luis.....	St. Agnes Hospital, Baltimore, Md.
Range, James Jacob.....	University Hospital, Baltimore, Md.
Ratliff, Cliff, Jr.....	University Hospital, Baltimore, Md.
Ream, Norman B.....	Mercy Hospital, Pittsburgh, Pa.
Recht, John Munn.....	Morrisania City Hospital, New York, N. Y.
Rinehart, Arthur Middleton.....	University Hospital, Baltimore, Md.
Robertson, Merritt Ezekiel.....	University Hospital, Baltimore, Md.
Rogers, George Carraway.....	United States Naval Hospital, Memphis, Tenn.
Rogers, William Brannon, Jr.....	City Hospital, Akron, Ohio
Santiago, Stevenson Parker.....	Hamot Hospital, Erie, Pa.
Sapareto, Rocco Luis.....	Cambridge Hospital, Cambridge, Mass.
Scherlis, Irving.....	Sinai Hospital, Baltimore, Md.
Shipley, Frank Mollman.....	University Hospital, Baltimore, Md.
Shortle, James Samuel.....	University Hospital, Baltimore, Md.
Sones, Frank Mason, Jr.....	University Hospital, Baltimore, Md.
Stegall, John Thomas.....	Medical College of Virginia, Hospital Division, Richmond, Va.
Sterling, Harold.....	Gallinger Municipal Hospital, Washington, D. C.
Strobel, Martin Edward.....	University Hospital, Baltimore, Md.
Summerlin, Glenn Olson.....	University Hospital, Baltimore, Md.
<sup>3</sup> Thompson, Talmadge Stanley.....	University Hospital, Baltimore, Md.

<sup>1</sup> Withdrew, March 7, 1944.

<sup>2</sup> Did not serve this period—illness, will begin October 1, 1944.

<sup>3</sup> Withdrew—illness, February 29, 1944.

Tilt, LeRoy Wortendyke, Jr.....	University Hospital, Baltimore, Md.
Vargas, Dharma Luz.....	Hamot Hospital, Erie, Pa.
Waldrop, Grayson Spencer.....	Roper Hospital, Charleston, S. C.
Walkup, Harry Ernest.....	St. Joseph's Hospital, Baltimore, Md.
West, George Brooks, Jr.....	South Baltimore General Hospital, Baltimore, Md.
Will, David Reid.....	Henry Ford Hospital, Detroit, Mich.
Williams, Thomas Richard, Jr.....	City Hospital, Winston-Salem, N. C.
Ziegler, Paul Randall.....	Mercy Hospital, Baltimore, Md.



## MATRICULATES

## SENIOR CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

ACTON, ELIZABETH, A.B., <i>American University, 1940</i> .....	New Jersey
BALDWIN, RUTH WORKMAN, <i>University of Maryland</i> .....	Illinois
BALLARD, WILLIAM RILEY, JR., A.B., <i>West Virginia University, 1940</i> ...	West Virginia
BENNETT, LILLIAM PEYKERT, A.B., M.A., <i>University of California, 1938, 1939</i>	California
BERRY, HERBERT LEE, <i>University of Southern California</i> .....	Arizona
BITSACK, JOSEPH WILLIAM, A.B., <i>The Johns Hopkins University, 1940</i> .....	New Jersey
BRANDT, FREDERICK BERTRAM, <i>University of Maryland</i> .....	District of Columbia
BROBST, HENRY THOMAS, A.B., <i>Oberlin College, 1940</i> .....	Pennsylvania
BROWN, CHARLES WILLIAM, A.B., <i>West Virginia University, 1940</i> .....	Pennsylvania
BROWN, JAMES MACK, A.B., <i>University of Alabama, 1940</i> .....	Alabama
COLON-YORDAN, ERNESTO, A.B., <i>University of Puerto Rico, 1940</i> .....	Puerto Rico
COOK, ELMER ELLSWORTH, JR., <i>University of Maryland</i> .....	Maryland
CORPENING, WILLIAM NYE, A.B., <i>University of North Carolina, 1940</i> ....	North Carolina
CROSBY, ROBERT MACGONIGLE NELSON, <i>The Johns Hopkins University</i> .....	Maryland
CURTISS, ROBERT KIMBER, A.B., <i>Colgate University, 1940</i> .....	New York
DANN, ALFRED HENRY, A.B., <i>The Johns Hopkins University, 1940</i> .....	Maryland
DAY, EDWARD COLSON, A.B., <i>College of Wooster, 1939</i> .....	New York
DILLON, HAROLD, B.S., <i>University of Maryland, 1940</i> .....	Maryland
DORMAN, HAMILTON PEACOCK, B.S., <i>Bates College, 1940</i> .....	District of Columbia
DOYLE, JOHN JUSTIN, B.S., <i>Boston College, 1940</i> .....	Massachusetts
EHRLICH, DANIEL, A.B., <i>The Johns Hopkins University, 1940</i> .....	Maryland
FERRI, HENRY GUY, B.S., <i>University of Pittsburgh, 1940</i> .....	Pennsylvania
FINEGOLD, AARON NATHAN, B.S., <i>University of Pittsburgh, 1940</i> .....	Pennsylvania
FOLEY, MARY JANE, A.B., <i>West Virginia University, 1941; B.S., West Virginia University School of Medicine, 1942</i> .....	West Virginia
FRYE, AUGUSTUS HOMER, JR., B.S., <i>University of Georgia, 1939</i> .....	Georgia
GALITZ, ELI, A.B., <i>New York University, 1939</i> .....	New York
GARRETT, RICHARD MITCHELL, <i>Emory University</i> .....	Alabama
GUBNITSKY, ALBERT, B.S., <i>University of Maryland, 1940</i> .....	Maryland
GUNTHER, JOSEPH ROY, <i>University of Maryland</i> .....	Maryland
HARRIS, WILLIAM MYRICK, <i>West Virginia University</i> .....	Maryland
HAUGHT, JOHN STEVENSON, <i>West Virginia University</i> .....	West Virginia
HORN BROOK, FRANCIS EUGENE, A.B., <i>West Virginia University, 1941; B.S., West Virginia University School of Medicine, 1942</i> .....	West Virginia
IGUINA-JIMENEZ, MANUEL ANTONIO, B.S., <i>University of Puerto Rico, 1941</i> ..	Puerto Rico
INGENITO, GABRIEL ANDREW, A.B., <i>University of Connecticut, 1940</i> .....	Connecticut
INGRAM, CHARLES HAL, A.B., <i>Duke University, 1940</i> .....	North Carolina
ISALES, LUIS MANUEL, B.S., <i>University of Puerto Rico, 1939</i> .....	Puerto Rico
JAWORSKI, MELVIN JOSEPH, B.S., <i>University of Maryland, 1940</i> .....	Maryland
KEENEY, DAN FRANKLIN, <i>University of Maryland</i> .....	Maryland
KEMPER, CHARLES ALEXANDER, A.B., <i>Duke University, 1940</i> .....	Maryland
KINNEY, EARL RAY, A.B., <i>University of Kansas, 1940</i> .....	West Virginia
KIRBY, ISHMAEL WORTHE, B.S., <i>University of North Carolina, 1941; University of North Carolina School of Medicine, 1940-1942</i> .....	North Carolina
KLEIMAN, ALLEN, A.B., <i>The Johns Hopkins University, 1940</i> .....	Maryland
LATIMER, CLARENCE VINETTE, JR., A.B., <i>Duke University, 1940</i> .....	New York
LURTING, FREDERICK WILBUR, B.S., <i>University of Pittsburgh, 1940</i> .....	Pennsylvania
MAMULA, PETER, A.B., <i>West Virginia University, 1940</i> .....	West Virginia
MARKS, ARNOLD ROBERT, A.B., <i>West Virginia University, 1940</i> .....	West Virginia
MCCORMACK, LLOYD LEO, <i>University of Virginia</i> .....	New Jersey
McFADDEN, ROBERT BURNS, B.S., <i>Loyola College, 1940</i> .....	Maryland
MCGRATH, WILLIAM EDWARD, JR., A.B., <i>Loyola College, 1939</i> .....	Maryland
McMULLIN, JOSEPH FREDERICK, A.B., <i>Ohio University, 1938</i> .....	Pennsylvania
MEADE, DEVOE KEPLER, B.S., <i>University of Maryland, 1940</i> .....	Maryland
MIRANDA, ANGEL NEFTALI, <i>University of Puerto Rico</i> .....	Puerto Rico
MORGAN, JACK CALVIN, A.B., <i>West Virginia University, 1940</i> .....	West Virginia
MYERS, MYRON JOSEPH, A.B., <i>The Johns Hopkins University, 1940</i> .....	Maryland
NELSON, ALFRED TURNER, <i>University of Michigan</i> .....	Maryland

NESBITT, ISAAC FLOYD, B.S., <i>University of North Carolina, 1941; University of North Carolina School of Medicine, 1940-1942.</i>	North Carolina
OZAZEWSKI, JOHN CASIMIR, B.S., <i>Loyola College, 1940.</i>	Maryland
PALESE, JOHN MICHAEL, <i>University of Maryland.</i>	Maryland
PETERS ROBERT JOSEPH, <i>West Virginia University.</i>	Pennsylvania
PFEIL, EDGAR THORNTON, <i>University of Maryland.</i>	Maryland
PINAS, SAMUEL RONALD, B.S., <i>University of Maryland, 1940.</i>	Maryland
POMEROY, WILLIAM HENRY, II, B.S., <i>Trinity College, 1938.</i>	Connecticut
RAFFUCCI-ARCE, FRANCISCO LUIS, <i>University of Puerto Rico.</i>	Puerto Rico
RANGE, JAMES JACOB, A.B., <i>Duke University, 1940.</i>	Tennessee
RATLIFE, CLIFF, JR., A.B., <i>Duke University, 1940.</i>	North Carolina
REAM, NORMAN, B.S., <i>Franklin and Marshall College, 1940.</i>	Pennsylvania
RECHT, JOHN MUNN, A.B., <i>Gettysburg College, 1940.</i>	New Jersey
RINEHART, ARTHUR MIDDLETON, B.S., <i>Trinity College, 1940.</i>	Maryland
ROBERTSON, MERRITT EZEKIEL, A.B., <i>Tusculum College, 1940.</i>	North Carolina
ROGERS, GEORGE CARRAWAY, A.B., <i>University of North Carolina, 1939.</i>	North Carolina
ROGERS, WILLIAM BRANNON, JR., B.S., <i>University of Akron, 1940.</i>	Ohio
SANTIAGO, STEVENSON PARKER, A.B., <i>Maryville College, 1940.</i>	Puerto Rico
SAPARETO, ROCCO LOUIS, B.S., <i>Tufts College, 1939.</i>	Massachusetts
SCHERLIS, IRVING, A.B., <i>The Johns Hopkins University, 1940.</i>	Maryland
SHIPLEY, FRANK MOLLMAN, A.B., <i>Western Maryland College, 1940.</i>	Maryland
SHORTLE, JAMES SAMUEL, B.S., <i>University of New Mexico, 1939.</i>	New Mexico
SONES, FRANK MASON, JR., A.B., <i>Western Maryland College, 1940.</i>	Maryland
STEGALL, JOHN THOMAS, B.S., <i>University of North Carolina, 1941; University of North Carolina School of Medicine, 1940-1942.</i>	North Carolina
STERLING, HAROLD, B.S., <i>University of Maryland, 1940.</i>	District of Columbia
STROBEL, MARTIN EDWARD, A.B., <i>Gettysburg College, 1940.</i>	Maryland
SUMMERLIN, GLENN OLSON, <i>Emory University.</i>	Florida
THOMPSON, TALMADGE STANLEY, <i>University of Maryland.</i>	Maryland
TILT, LEROY WORTENDYKE, JR., A.B., <i>Oberlin College, 1939.</i>	Maryland
VARGAS, DHARMA LUZ, B.S., <i>University of Puerto Rico, 1940.</i>	Puerto Rico
WALDROP, GRAYSON SPENCER, A.B., <i>University of North Carolina, 1940.</i>	North Carolina
WALKUP, HARRY ERNEST, <i>West Virginia University.</i>	West Virginia
WEST, GEORGE BROOKS, JR., B.S., <i>College of William and Mary, 1940.</i>	Virginia
WILL, DAVID REID, <i>Ohio State University.</i>	Ohio
WILLIAMS, THOMAS RICHARD, JR., A.B., <i>Duke University, 1940.</i>	North Carolina
ZIEGLER, PAUL RANDALL, <i>University of Maryland.</i>	Maryland

### JUNIOR CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

ALVAREZ, JOSÉ ALBERTO, <i>University of Puerto Rico.</i>	Puerto Rico
ANCHELL, MELVIN, B.S., <i>University of Maryland, 1941.</i>	Maryland
ARDINGER, JOSEPH STANLEY, JR., <i>University of Maryland.</i>	Maryland
BACON, ARTHUR MAYNARD, JR., B.S., <i>Loyola College, 1941.</i>	Maryland
BELL, HOUSTON LESHIER, <i>University of Maryland.</i>	Maryland
BLOXOM, JOHN MADISON, III, B.S., <i>University of Virginia, 1941.</i>	Virginia
BRADY, CHARLES ELDON, A.B., <i>University of North Carolina, 1939.</i>	North Carolina
BRADY, FRANK JOSEPH, B.S., <i>Washington College, 1941.</i>	Maryland
BRANDES, HERBERT GIBBS, <i>University of Maryland.</i>	District of Columbia
BRILL, WARREN DANIEL, B.S., <i>University of Maryland, 1941.</i>	Maryland
BROWN, RICHARD JAMES, <i>University of Maryland.</i>	Connecticut
BUCKEY, ROBERT BRUCE, A.B., <i>University of New Mexico, 1941.</i>	Maryland
CALLAHAN, DANIEL HARRY, JR., B.S., <i>Bowdoin College, 1941.</i>	Massachusetts
CARR, CHARLES EDWIN, JR., B.S., <i>Loyola College, 1941.</i>	Maryland
CHAPUT, CHARLES DUPRÉ, A.B., <i>Dartmouth College, 1941.</i>	Massachusetts
CINTRÓN, MIGUEL, <i>West Virginia University.</i>	Puerto Rico
CLONINGER, ROWELL CONNOR, A.B., <i>Lenoir Rhyne College, 1942.</i>	North Carolina
COPELAND, HERBERT BERNARD, JR., <i>West Virginia University.</i>	West Virginia
COWLEY, R. ADAMS, <i>University of Utah.</i>	Utah
DODD, PATRICIA, <i>University of Maryland.</i>	Georgia
DOUKAS, JAMES A., B.S., <i>Washington College, 1941.</i>	Maryland
DRAKE, MILES EDWARD, B.S., <i>Oregon State College, 1933; M.S., Oregon State College, 1934; Ph. D., University of Southern California, 1938.</i>	Maryland

EBELING, WILLIAM CARL, III, <i>University of Maryland</i> .....	Maryland
ELIAS, THOMAS GLENN, A.B., <i>Western Maryland College, 1941</i> .....	Maryland
EVERETT, JOHN THOMAS, B.S., <i>Mt. St. Mary's College, 1941</i> .....	Maryland
FARKAS, ROBERT WILLIAM, A.B., <i>University of Maryland, 1941</i> .....	Pennsylvania
FEASTER, JAMES HENRY, JR., A.B., <i>West Virginia University, 1941</i> .....	West Virginia
FELDMAN, MAURICE, JR., A.B., <i>The Johns Hopkins University, 1941</i> .....	Maryland
FOARD, WILBUR HARPER, <i>Asbury College</i> .....	Maryland
FUTTERMAN, PERRY, A.B., <i>The Johns Hopkins University, 1941</i> .....	Maryland
GARCÍA Y GARCÍA, JOSÉ ANTONIO, B.S., <i>University of Puerto Rico, 1941</i> .....	Puerto Rico
GASSAWAY, FRANKLYN DRENNAN, <i>University of Maryland</i> .....	Arizona
GODLOVE, JOHN CARLTON, A.B., <i>Dickinson College, 1933</i> .....	Maryland
GOLDSTEIN, MARVIN, A.B., <i>The Johns Hopkins University 1941</i> .....	Maryland
GRUMBINE, FRANCIS LEVINE, A.B., <i>Western Maryland College, 1941</i> .....	Maryland
GUTHRIE, WILLIAM WILKINSON, A.B., <i>University of Pennsylvania, 1941</i> .....	West Virginia
GUY, ERNEST GORDON, B.S., <i>University of North Carolina, 1941; University of North Carolina School of Medicine, 1941-1943</i> .....	North Carolina
HAMILL, JAMES EDWARD, B.S., <i>University of Maryland, 1941</i> .....	Maryland
HAYDEN, RICHARD CARROLL, <i>University of Maryland</i> .....	Maryland
HEROLD, PAUL GARMER, <i>Duke University</i> .....	Maryland
HOBELMANN, CHARLES FREDERICK, A.B., <i>The Johns Hopkins University, 1941</i> .....	Maryland
HÖLLJES, HENRY WIRT DUVAL, A.B., <i>Western Maryland College, 1941</i> .....	Maryland
HORN, HELEN AMELIA, A.B., <i>Goucher College, 1941</i> .....	Maryland
HOUSKA, HENRY JOHN, A.B., <i>Loyola College, 1941</i> .....	Maryland
INGRAM, PHYLLIS RAY, B.S., <i>University of Vermont, 1943</i> .....	Maryland
INGRAM, WILLIAM BRAXTON, B.S., <i>University of North Carolina, 1942; University of North Carolina School of Medicine, 1941-1943</i> .....	North Carolina
JERNIGAN, JOHN MAYO, JR., B.S., <i>University of Maryland, 1941</i> .....	Maryland
JONES, BOBBY LEE, B.S., <i>University of Maryland, 1941</i> .....	Maryland
KISHPAUGH, MARJORIE BIRD, B.S., <i>Lebanon Valley College, 1941</i> .....	Pennsylvania
KREIS, GEORGE JOSEPH, JR., B.S., <i>University of Maryland, 1941</i> .....	Maryland
LAMBERT, HERMAN JAMES, JR., B.S., <i>University of Hawaii, 1941</i> .....	Georgia
LAMPLEY, WILLIAM ASKEW, B.S., <i>Furman University, 1941</i> .....	North Carolina
LERMAN, PHILIP H., B.S., <i>University of Maryland, 1940</i> .....	Maryland
LEVINE, STUART CHARLES, B.S., <i>University of Maryland, 1941</i> .....	Maryland
LILIENFELD, ABRAHAM MORRIS, A.B., <i>The Johns Hopkins University, 1941; Albany Medical College, 1941-1942</i> .....	Maryland
LITTLEFIELD, JAMES BEATON, A.B., <i>University of Virginia, 1941</i> .....	Massachusetts
MAXWELL, GEORGE ALEXANDER, JR., <i>University of Maryland</i> .....	Maryland
MILLOFF, BERNARD, B.S., <i>University of Maryland, 1941</i> .....	Maryland
MINTZER, DONALD WILLIS, <i>University of Maryland</i> .....	New Jersey
MORROW, THOMAS LACY, JR., B.S., <i>University of North Carolina, 1942; University of North Carolina School of Medicine, 1941-1943</i> .....	District of Columbia
MOSBERG, WILLIAM HENRY, JR., <i>University of Maryland</i> .....	Maryland
NORMENT, RICHARD BAXTER, III, <i>University of Maryland</i> .....	Maryland
O'DONNELL, CHARLES FRANCIS, <i>The Johns Hopkins University</i> .....	Maryland
OSBORNE, WILLIAM WILSON, <i>University of Georgia</i> .....	Georgia
PATTERSON, CARL NORRIS, B.S., <i>Franklin and Marshall College, 1941</i> .....	Maryland
PIERPONT, EDWIN LOWELL, <i>University of Maryland</i> .....	Maryland
POOL, CHAMPE CLARK, A.B., <i>West Virginia University, 1941</i> .....	West Virginia
PRATT, LOUIS JOHN, B.S., <i>Loyola College, 1941</i> .....	Maryland
RAMUNDO, MICHAEL RAYMOND, A.B., <i>Syracuse University, 1941</i> .....	New Jersey
RANDOLPH, EDWARD BURL, <i>West Virginia University</i> .....	West Virginia
REES, DAVID THOMAS, A.B., <i>West Virginia University, 1938</i> .....	Pennsylvania
RILEY, EUGENE JOHN, <i>University of Maryland</i> .....	Maryland
ROBBINS, MORRIS ALLEN, A.B., <i>University of Pennsylvania, 1941</i> .....	New Jersey
ROLFES, HARRY FRANKLIN, <i>University of Maryland</i> .....	Maryland
RUBENSTONE, ALBERT IRVING, A.B., <i>University of Pennsylvania, 1941</i> .....	Maryland
SCAVONE, EDMOND, B.S., <i>Loyola College, 1941</i> .....	Maryland
SCHWARTZ, AARON DAVID, A.B., <i>University of Pennsylvania, 1941</i> .....	New York
SEABRIGHT, HOWARD LEE, A.B., <i>Washington and Jefferson College, 1941</i> .....	West Virginia
SHAW, CHARLES EDWARD, JR., <i>University of Maryland</i> .....	Maryland
SIMONS, GEORGE MURRAY, <i>University of Maryland</i> .....	Maryland
SPELSBERG, WALTER KARL, <i>University of Maryland</i> .....	West Virginia



STEINBERG, STANLEY HERBERT, <i>University of Maryland</i> .....	District of Columbia
STICHEL, FREDERICK LOUIS, JR., <i>University of Maryland</i> .....	Maryland
TAYLOR, SARAH ALICE, B.S., <i>University of North Carolina, 1942; University of North Carolina School of Medicine, 1941-1943</i> .....	North Carolina
THOMPSON, LEWIS BRADFORD, <i>Dartmouth College</i> .....	Massachusetts
TINKER, FRANCIS PAUL, B.S., <i>Loyola College, 1941</i> .....	Maryland
TRABAND, MILLARD TOLSON, JR., B.S., <i>University of Maryland, 1937</i> .....	Maryland
TURNER, ROY BYRON, JR., B.S., <i>University of Maryland, 1943</i> .....	District of Columbia
ULLSPERGER, JOHN FRANCIS, A.B., <i>Loyola College, 1941</i> .....	Maryland
WEHLING, BENJAMIN BIRD, B.S., <i>Wheaton College, 1941</i> .....	Ohio
WILKINS, KENNETH WORTH, B.S., <i>University of North Carolina, 1942; University of North Carolina School of Medicine, 1941-1943</i> .....	North Carolina
WILSON, MARY STUART, A.B., <i>Randolph-Macon College, 1941</i> .....	Maryland
WOODEN, ALLEN CURTIS, B.S., <i>Wake Forest College, 1941</i> .....	Maryland
WOODRUM, OLIN CAIN, <i>The Johns Hopkins University</i> .....	Maryland
WRIGHT, ISAAC CLARK, B.S., <i>University of North Carolina, 1942; University of North Carolina School of Medicine, 1941-1943</i> .....	North Carolina
YAFFE, STANLEY NORMAN, B.S., <i>University of Maryland, 1941</i> .....	Maryland

### SOPHOMORE CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

AMSTERDAM, BENJAMIN, B.S., <i>University of Maryland, 1942</i> .....	New Jersey
ANDERSON, GEORGE HAGAN, B.S., <i>University of Florida, 1942</i> .....	Florida
ARNOLD, GAYLE GARDNER, A.B., <i>The Johns Hopkins University, 1942</i> .....	Maryland
AYD, FRANK JOSEPH, JR., A.B., <i>Loyola College, 1942</i> .....	Maryland
BARKER, DAVID HARGIS, B.S., <i>University of Maryland, 1943</i> .....	Maryland
BARNES, THOMAS GORDON, A.B., <i>Emory University, 1942</i> .....	Georgia
BAROODY, PHILIP CHARLES, A.B., <i>St. Anselm's College, 1942</i> .....	New Hampshire
BELL, DAVID FOWLER, JR., B.S., <i>University of Maryland, 1942</i> .....	Maryland
BERDIANSKY, BENJAMIN, A.B., <i>The Johns Hopkins University, 1942</i> .....	Maryland
BRANNEN, JOSEPH HARRISON, A.B., <i>Emory University, 1942</i> .....	Georgia
BRENDLE, WILLIAM KENDIG, B.S., <i>University of Maryland, 1942</i> .....	Maryland
<sup>1</sup> BROSEMER, LOWELL RUSSELL, A.B., <i>University of California, 1942</i> .....	California
BYRNE, ROBERT FRANCIS, B.S., <i>University of Maryland, 1943</i> .....	Maryland
CALLENDER, GEORGE RUSSELL, JR., B.S., <i>University of Maryland, 1943</i> .....	District of Columbia
CAMPONESCHI, OSCAR WILDE, B.S., <i>University of Maryland, 1942</i> .....	Maryland
CANTER, NATHAN, B.S., <i>Loyola College, 1942</i> .....	Maryland
CLARK, MARY DORCAS, <i>West Virginia University</i> .....	Pennsylvania
CONNER, EUGENE HAYWARD, <i>University of Maryland</i> .....	Maryland
COOK, SALLIE, A.B., <i>University of Pennsylvania, 1942</i> .....	Maryland
DAVIS, JOHN BERNARD, <i>University of Maryland</i> .....	Maryland
DAVIS, RALPH FLETCHER, B.S., <i>University of Maryland, 1942</i> .....	Maryland
DE ALBA, EDUARDO, JR., A.B., <i>The Johns Hopkins University, 1942</i> .....	Panama, R. P.
DENNIS, JOHN MURRAY, B.S., <i>University of Maryland, 1943</i> .....	Maryland
DOENGES, JOHN PELL, A.B., <i>Western Maryland College, 1942</i> .....	Maryland
FITZPATRICK, VINCENT DEPAUL, JR., A.B., <i>Loyola College, 1942</i> .....	Maryland
FRANK, WILLIAM HENRY, <i>University of Pittsburgh</i> .....	Pennsylvania
GANEY, JOSEPH BRANNEN, A.B., <i>Emory University, 1942</i> .....	Florida
GIVENS, AUSTIN EDWARD, A.B., <i>Pomona College, 1942</i> .....	Maryland
GREENLEAF, HELEN EMILY, B.S., <i>Bucknell University, 1941</i> .....	New Jersey
HALL, ARTHUR THOMAS, JR., B.S., <i>Loyola College, 1942</i> .....	Maryland
HAMBURGER, DANIEL OSCAR, A.B., <i>The Johns Hopkins University, 1942</i> .....	Maryland
HAYNES, HOWARD HARRY, JR., <i>University of Utah</i> .....	Utah
HEDRICK, JOHN ALBERT, <i>Marshall College</i> .....	West Virginia
HENNESSY, JOHN FRANCIS, A.B., <i>The Johns Hopkins University, 1942</i> .....	New Jersey
HERRICK, STANLEY EDWARD, JR., B.S., <i>Bowdoin College, 1942</i> .....	Massachusetts
HERRMANN, ALBERT CASPER, B.S., <i>University of Maryland, 1943</i> .....	Maryland
HOLBROOK, WILLIAM ADDISON, JR., B.S., <i>University of Maryland, 1942</i> .....	Maryland
HOYOS-NAPOLEONI, HECTOR ANTONIO, <i>West Virginia University</i> .....	Puerto Rico
HUTHCHINS, HARRY, <i>Emory University</i> .....	Georgia

<sup>1</sup> Did not complete the year—illness.



KEISTER, STEPHEN RIDINGER, <i>Duke University</i> .....	Pennsylvania
KELLY, ALEXANDER PALMER, JR., <i>B.S., University of Maryland, 1943</i> .....	North Carolina
KENWORTHY, RICHARD ALBERT, III, <i>Yale University</i> .....	Maryland
KURLAND, LEONARD TERRY, <i>A.B., The Johns Hopkins University, 1942</i> .....	Maryland
LEMEN, DANIEL BAIR, <i>B.S., University of Maryland, 1943</i> .....	Maryland
LINTHICUM, CHARLES MILTON, <i>B.S., University of Maryland, 1943</i> .....	Maryland
MAGUIRE, HENRY FRANCIS, <i>B.S., Washington College, 1942</i> .....	New Jersey
MCNINCH, JAMES ROBINSON, JR., <i>A.B., Washington &amp; Jefferson College, 1942</i> .....	Pennsylvania
MILLER, CLARENCE STOCKTON, <i>University of Nevada</i> .....	Maryland
MYERS, PAUL ROBERT, <i>A.B., Western Maryland College, 1942</i> .....	Maryland
NORTON, ALFRED SIMPSON, <i>B.S., University of Maryland, 1943</i> .....	District of Columbia
O'NEILL, ALLEN JAY, <i>B.S., University of Maryland, 1943</i> .....	Virginia
OTT, ROY HAMILTON, JR., <i>A.B., Williams College, 1942</i> .....	New York
OWEN, ARTHUR JOHN, <i>A.B., Loyola College, 1942</i> .....	Maryland
PECK, ROBERT DEWITT, <i>A.B., West Virginia University, 1942</i> .....	West Virginia
PHILLIPS, MALCOLM DUDLEY, <i>Houghton College</i> .....	Maryland
PIKE, WARREN HORTON, JR., <i>B.S., Virginia Military Institute, 1942</i> .....	Indiana
REAH, JOSEPH EDWARD, <i>B.S., Loyola College, 1942</i> .....	Maryland
ROBINSON, WILLIAM HENRY, <i>The Johns Hopkins University</i> .....	Maryland
ROSENBLATT, LEAH, <i>A.B., Hood College, 1942</i> .....	Maryland
ROSENTHAL, JOHN LAUCHEIMER, <i>A.B., The Johns Hopkins University, 1942</i> .....	Maryland
RUDO, ALVIN DAVID, <i>The Johns Hopkins University</i> .....	Maryland
RUDO, MARVIN, <i>B.S., University of Maryland, 1942</i> .....	Maryland
SANCHEZ, HILARION, JR., <i>West Virginia University</i> .....	Puerto Rico
SOKOLSKI, EDWARD JOHN, <i>A.B., Norwich University, 1942</i> .....	Connecticut
STEDER, ANTHONY FREDERICK AUGUSTINE, JR., <i>A.B., Loyola College, 1942</i> .....	Maryland
STEINBACH, STANLEY ROY, <i>A.B., The Johns Hopkins University, 1942</i> .....	Maryland
STEWART, CHARLES WILBUR, JR., <i>The Johns Hopkins University</i> .....	Maryland
STRAHAN, CHARLES, JR., <i>B.S., Dickinson College, 1942</i> .....	Maryland
STREET, RUSSELL BARBER, JR., <i>University of Wisconsin</i> .....	Massachusetts
SUMMERLIN, WINSTON LEE, <i>University of Florida</i> .....	Florida
TANSEY, JOHN JEROME, <i>Brown University</i> .....	Massachusetts
TOUCHET, MARY LOUISE, <i>B.S., University of Maryland, 1943</i> .....	Maryland
TREVASKIS, ALLAN EDWARD, <i>Harvard University</i> .....	Maryland
TRUMBO, ROBERT BENSON, <i>Emory University</i> .....	Florida
WAGNER, VICTOR, <i>University of Pennsylvania</i> .....	New Jersey
WEINBERG, HAROLD HERBERT, <i>B.S., Loyola College, 1942</i> .....	Maryland
WEINTRAUB, JOSEPH, <i>B.S., University of Maryland, 1942</i> .....	Maryland
WHEELER, THOMAS EASSON, <i>The Johns Hopkins University</i> .....	Maryland
WHITE, JOSEPH MCCURLEY, III, <i>B.S., Loyola College, 1942</i> .....	Maryland
WINSLOW, OLIVER PARRY, JR., <i>The Johns Hopkins University</i> .....	Maryland
WOODWARD, ARTHUR FLETCHALL, <i>B.S., University of Maryland, 1942</i> .....	Maryland
ZIEGLER, JOHN BOSLEY, <i>A.B., Gettysburg College, 1942</i> .....	Maryland
ZINBERG, NORMAN EARL, <i>B.S., University of Maryland, 1942</i> .....	Maryland

## FRESHMAN CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

AMLICKE, JEANNE DOROTHY, <i>B.S., University of Maryland, 1943</i> .....	New Jersey
ARNOLD, JESSE HOYT, JR., <i>University of North Dakota</i> .....	Maryland
AUDET, CHARLES HENRY, JR., <i>University of Maryland</i> .....	Connecticut
AUDET, ROBERT JOSEPH, <i>University of Maryland</i> .....	Connecticut
BANNEN, WILLIAM JAMES, JR., <i>B.S., Bethany College, 1943</i> .....	Pennsylvania
BAUER, ROBERT EDWARD, <i>A.B., The Johns Hopkins University, 1943</i> .....	Maryland
BENAVENT, WALTER JOSÉ, <i>B.S., University of Maryland, 1943</i> .....	Puerto Rico
BONIFANT, ALFRED DEMENT, <i>B.S., University of Maryland, 1943</i> .....	Maryland
BRICKNER, JOHN GEORGE, III, <i>Loyola College</i> .....	Maryland
BROWN, ELI MATTHEW, <i>University of Maryland</i> .....	Maryland
BROWN, ROBERT RAY, <i>West Virginia University</i> .....	West Virginia
BUCKNER, LOUISE PADDON, <i>B.S., University of Maryland</i> .....	Maryland
CANO, HAROLD VERNON, <i>University of Maryland</i> .....	New Jersey
CARR, WILLIAM FRANCIS, <i>Mt. St. Mary's College</i> .....	Pennsylvania
CHRISTOPHER, THOMAS WEST, <i>Brown University</i> .....	Massachusetts
CLYMAN, SIDNEY GARY, <i>University of Maryland</i> .....	Maryland

CODD, FRANCIS IGNATIUS, B.S., <i>University of Maryland</i> , 1941.....	Maryland
COHN, JEROME ELIAS, A.B., <i>The Johns Hopkins University</i> , 1943.....	Maryland
CONNOR, THOMAS BYRNE, A.B., <i>Loyola College</i> , 1943.....	Maryland
CORASANITI, RITA ANNE, <i>University of Maryland</i> .....	Maryland
CROSS, RICHARD JOSEPH, JR., B.S., <i>Mt. St. Mary's College</i> , 1943.....	Maryland
D'ANTONIO, JOSEPH, <i>Maryville College</i> .....	Maryland
DAVIS, JOHN EDWARD, JR., <i>Randolph-Macon College</i> .....	West Virginia
DIAZ-CARAZO, JOSÉ, B.S., <i>Mt. St. Mary's College</i> , 1942.....	Puerto Rico
DRIGGS, GUY KENNETH, <i>University of Arizona</i> .....	Arizona
EARECKSON, VINCENT OFFLEY, JR., <i>University of Maryland</i> .....	Maryland
EATON, JAY WARREN, <i>University of Maryland</i> .....	Maryland
EAVEY, JAMES LEE, B.S., <i>Franklin and Marshall College</i> , 1943.....	Maryland
FISCHER, JOSEPH SAMUEL, A.B., <i>The Johns Hopkins University</i> , 1943.....	Maryland
FISHER, GEORGE WILLIAM, B.S., <i>Franklin and Marshall College</i> , 1943.....	Maryland
FRIEDMAN, ASHER ARTHUR, A.B., <i>The Johns Hopkins University</i> , 1943.....	Virginia
FRYE, PAUL EUGENE, <i>University of Maryland</i> .....	Maryland
GABY, SAMUEL DAVID, A.B., <i>The Johns Hopkins University</i> , 1943.....	Maryland
GAMBLE, JOHN REEVES, JR., A.B., <i>Emory University</i> , 1943.....	North Carolina
GENTRY, WILLIAM DANIEL, JR., <i>University of Maryland</i> .....	Maryland
GERLACH, JAMES JOHNSON, <i>University of Colorado</i> .....	Maryland
GOETZ, ABRAHAM AARON, <i>The Johns Hopkins University</i> .....	New York
GRAY, HARRY WILLIAM, <i>University of Maryland</i> .....	Maryland
GREENFIELD, DUANE LEONARD, A.B., <i>Sioux Falls College</i> , 1939; M.A., <i>Columbia University</i> , 1940.....	Maryland
HANSEN, LELAND JAY, <i>Utah State Agriculture College</i> .....	Utah
HARDIN, HENRY CARTER, JR., A.B., <i>Emory University</i> , 1943.....	Florida
HARLEY, JOHN BARKER, B.S., <i>Dickinson College</i> , 1943.....	Maryland
HAWKINS, CHARLES WILLIAM, <i>University of Chattanooga</i> .....	Tennessee
HEFNER, CHARLES ARTHUR, <i>West Virginia University</i> .....	West Virginia
HENDRICKSON, EDWIN OKEY, III, <i>The Johns Hopkins University</i> .....	Maryland
HILL, HARRY EDWARD, B.S., <i>University of Maryland</i> , 1942.....	Maryland
HUNTER, J. POULSON, B.S., <i>University of Utah</i> , 1943.....	Utah
HYMAN, NATHAN BERNARD, <i>The Johns Hopkins University</i> .....	Maryland
JENNINGS, ERWIN REEVES, <i>Emory University</i> .....	Georgia
KIEL, AUGUST, <i>University of Maryland</i> .....	Maryland
KNAPP, HARRY GROVE ROBERT, <i>University of Colorado</i> .....	North Dakota
KNOX, LAWRENCE JOSEPH, <i>Loyola College</i> .....	Maryland
LATIMER, JOHN HOWARD, <i>University of Utah</i> .....	Utah
LEVICKAS, HERBERT JOSEPH, <i>University of Maryland</i> .....	Maryland
MACHT, ALLAN HARRIS, <i>University of Maryland</i> .....	Maryland
MAHOLICK, LEONARD THOMAS, <i>University of Maryland</i> .....	District of Columbia
MARKLEY, RAYMOND LAW, JR., A.B., <i>Gettysburg College</i> , 1943.....	Pennsylvania
MARSHALL, CHARLES BENTON, JR., <i>Ohio University</i> .....	West Virginia
MASSENBURG, GEORGE YELLOTT, <i>Duke University</i> .....	Georgia
MAY, ROBERT EUGENE, A.B., <i>Loyola College</i> , 1942.....	Maryland
McELPATRICK, GEORGE CHARLES, <i>Dartmouth College</i> .....	Delaware
McPHERSON, THOMAS COTESWORTH, <i>Emory University</i> .....	Georgia
McWILLIAMS, CLARENCE EMANUEL, JR., A.B., <i>Western Maryland College</i> , 1943.....	Maryland
MINTZER, JOSEPH HERMAN, B.S., <i>University of Maryland</i> , 1943.....	New York
MITCHELL, JOHN ARMITAGE, <i>Gettysburg College</i> .....	Maryland
MORRISON, JOHN EDWARD, <i>The Johns Hopkins University</i> .....	Maryland
NATARO, JEROME PAUL, B.S., <i>Seton Hall College</i> , 1942.....	Kentucky
NELSON, ROBERT EDWIN, <i>Brown University</i> .....	Massachusetts
NICHOLS, POMEROY, JR., <i>Emory University</i> .....	North Carolina
NORTH, ELLSWORTH HOWARD, JR., <i>Columbia University</i> .....	Maryland
O'HARE, JAMES STEWART, B.S., <i>Loyola College</i> , 1943.....	Maryland
O'LEARY, FRANK MICHAEL, B.S., <i>Loyola College</i> , 1943.....	Maryland
ORRISON, WILLIAM WERNER, A.B., <i>Western Maryland College</i> , 1943.....	Maryland
OSBORNE, HORACE HENRY, <i>University of Georgia</i> .....	Georgia
PARK, WILLIAM FAVRE, <i>University of Maryland</i> .....	Maryland
PAUL, EARL RUPERT, <i>University of Virginia</i> .....	Maryland

<sup>1</sup> Entered Second Semester, Aug. 30, 1943.

PECK, CLEMMER MARCUS, B.S., <i>Hampden-Sydney College, 1942</i> .....	West Virginia
PLATT, LOIS IRENE, A.B., <i>Goucher College, 1931</i> .....	Maryland
RAWLINS, JOHN CALVIN, B.S., <i>Western Maryland College, 1943</i> .....	Delaware
REISCH, MILTON, <i>University of Maryland</i> .....	Maryland
REITER, RALPH ALAN, <i>Bridgewater College</i> .....	Maryland
RILEY, ROBERT ANNAN, JR., <i>Emory University</i> .....	Ohio
ROBERTS, JAMES ALWIN, <i>University of Maryland</i> .....	Maryland
ROSSBERG, ROBERT CRITTENDEN, <i>University of Maryland</i> .....	Maryland
SACKS, SIDNEY, <i>University of Maryland</i> .....	Maryland
SEWELL, JAMES ANDERSON, <i>Emory University</i> .....	Florida
SHALLENGER, FRANK ANTHONY, JR., <i>Loyola College</i> .....	Maryland
SILLS, DAVID NICHOLSON, JR., <i>University of Maryland</i> .....	Delaware
SMITH, EDWARD MILTON, JR., <i>Loyola College</i> .....	Maryland
SMITH, EDWARD PATRICK, JR., <i>Loyola College</i> .....	Maryland
STALLARD, CLINTON WOLFE, JR., <i>West Virginia Institute of Technology</i> ....	West Virginia
STEWART, JOHN WILSON, <i>Western Maryland College</i> .....	Maryland
SWINDELL, HERBERT VAN ARDEN, <i>University of Maryland</i> .....	Maryland
TOBY, LEON, A.B., <i>The Johns Hopkins University, 1943</i> .....	Maryland
VAUGHN, JAMES ANDERSON, JR., A.B., <i>Emory University, 1943</i> .....	Florida
WEITZMAN, ELLIOTT LIONEL, <i>The Johns Hopkins University</i> .....	Maryland
WENTZ, IRL JESSE, A.B., <i>Western Maryland College, 1942</i> .....	Pennsylvania
WLODKOWSKI, VICTOR THOMAS, <i>University of Maryland</i> .....	Maryland
WOLFE, WALTER MCILHANEY, JR., <i>Virginia Military Institute</i> .....	Maryland
WORKMAN, JOSEPH BERKELEY, A.B., <i>Western Maryland College, 1943</i> .....	Maryland
YOUNG, ALEXANDER WILLIAM, JR., <i>University of Maryland</i> .....	West Virginia
YOUNG, RICHARD ATLEE, A.B., <i>Gettysburg College, 1943</i> .....	Maryland

## SUMMARY OF STUDENTS

(April 8, 1943 to December 23, 1943)

	Male	Female	Final Total
Senior Class.....	85	5	90
Junior Class.....	90	6	96
<sup>1</sup> Sophomore Class.....	(78) 77	5	(83) 82
<sup>2</sup> Freshman Class.....	(97) 98	4	(101) 102
	350	20	370

<sup>1</sup> One withdrawal, July 3, 1943.

() = No. on April 8, 1943.

<sup>2</sup> One admission, August 30, 1943.

## GEOGRAPHICAL DISTRIBUTION OF STUDENTS

(April 8, 1943 to December 23, 1943)

Alabama.....	2	New Mexico.....	1
Arizona.....	3	New York.....	8
California.....	2	North Carolina.....	16
Connecticut.....	6	North Dakota.....	1
Delaware.....	3	Ohio.....	4
District of Columbia.....	8	Pennsylvania.....	20
Florida.....	9	Tennessee.....	3
Georgia.....	11	Utah.....	5
Illinois.....	1	Virginia.....	1
Indiana.....	1	West Virginia.....	23
Kentucky.....	1		
Maryland.....	199		
Massachusetts.....	11	FOREIGN	
New Hampshire.....	1	Republic of Panama.....	1
New Jersey.....	15	Puerto Rico.....	16

## LIST OF COLLEGE SOURCES OF STUDENTS ENROLLED

Session—April 8, 1943 to December 23, 1943

Alabama, University of.....	1	Mt. St. Mary's College.....	4
American University.....	1	Nevada, University of.....	1
Arizona, University of.....	1	New Mexico, University of.....	2
Asbury College.....	1	New York University.....	1
Bates College.....	1	North Carolina, University of.....	11
Bethany College.....	1	North Dakota, University of.....	1
Boston College.....	1	Norwich University.....	1
Bowdoin College.....	2	Oberlin College.....	2
Brown University.....	3	Ohio State University.....	1
Bucknell University.....	1	Ohio University.....	1
California, University of.....	2	Pennsylvania, University of.....	6
Chattanooga, University of.....	2	Pittsburgh, University of.....	3
Colgate University.....	1	Pomona College.....	1
Colorado, University of.....	2	Puerto Rico, University of.....	8
Columbia University.....	2	Randolph-Macon College.....	3
Connecticut, University of.....	1	St. Anselm's College.....	1
Dartmouth College.....	3	Seton Hall College.....	1
Dickinson College.....	2	Sioux Falls College.....	1
Duke University.....	8	Southern California, University of....	2
Emory University.....	15	Syracuse University.....	1
Florida, University of.....	2	Trinity College.....	2
Franklin & Marshall College.....	4	Tufts College.....	1
Furman University.....	1	Tusculum College.....	1
Georgia, University of.....	3	Utah, University of.....	5
Gettysburg College.....	6	Utah State Agricultural College.....	1
Goucher College.....	2	Vermont, University of.....	1
Hampden-Sydney College.....	1	Virginia Military Institute.....	2
Harvard University.....	1	Virginia, University of.....	4
Hawaii, University of.....	1	Wake Forest College.....	1
Hood College.....	1	Washington College.....	3
Houghton College.....	1	Washington & Jefferson College.....	2
Johns Hopkins University.....	38	Western Maryland College.....	13
Kansas, University of.....	1	West Virginia Institute of Technol- ogy.....	1
Lebanon Valley College.....	1	West Virginia University.....	25
Lenoir Rhyne College.....	1	Wheaton College.....	1
Loyola College.....	27	William & Mary, College of.....	1
Marshall College.....	1	Williams College.....	1
Maryland, University of.....	106	Wisconsin, University of.....	1
Maryville College.....	2	Wooster, College of.....	1
Michigan, University of.....	1	Yale University.....	1



# INTERNSHIPS—CANDIDATES FOR GRADUATION ON SEPTEMBER 29, 1944

Effective October 1, 1944

Alvarez, José Alberto.....	St. Agnes' Hospital, Baltimore, Md.
Anchell, Melvin.....	Sinai Hospital, Baltimore, Md.
Ardinger, Joseph Stanley.....	South Baltimore General Hospital, Baltimore, Md.
Bacon, Arthur Maynard, Jr.....	St. Joseph's Hospital, Baltimore, Md.
Bell, Houston Leshner.....	Mercy Hospital, Baltimore, Md.
Bloxom, John Madison, III.....	South Baltimore General Hospital, Baltimore, Md.
Brady, Charles Eldon.....	City Hospital, Winston-Salem, N. C.
Brady, Frank Joseph.....	Maryland General Hospital, Baltimore, Md.
Brandes, Herbert Gibbs.....	Central Dispensary and Emergency Hospital, Washington, D. C.
Brill, Warren Daniel.....	Gallinger Municipal Hospital, Washington, D. C.
Brown, Richard James.....	Bridgeport Hospital, Bridgeport, Conn.
Buckey, Robert Bruce.....	Sacred Heart Hospital, Spokane, Wash.
Callahan, Daniel Harry, Jr.....	Worcester City Hospital, Worcester, Mass.
Carr, Charles Edwin, Jr.....	St. Agnes' Hospital, Baltimore, Md.
Chaput, Charles Dupré.....	University Hospital, Baltimore, Md.
Cintrón, Miguel.....	Fajardo Charity District Hospital, Fajardo, P. R.
Cloninger, Rowell Connor.....	University Hospital, Baltimore, Md.
Copeland, Herbert Bernard, Jr.....	Gallinger Municipal Hospital, Washington, D. C.
Cowley, R. Adams.....	University Hospital, Baltimore, Md.
Dodd, Patricia.....	University Hospital, Baltimore, Md.
Doukas, James A.....	West Baltimore General Hospital, Baltimore, Md.
Drake, Miles Edward.....	University Hospital, Baltimore, Md.
Ebeling, William Carl, III.....	University Hospital, Baltimore, Md.
Elias, Thomas Glenn.....	University Hospital, Baltimore, Md.
Everett, John Thomas.....	St. Joseph's Hospital, Baltimore, Md.
Farkas, Robert William.....	Sinai Hospital, Baltimore, Md.
Feaster, James Henry, Jr.....	Charleston General Hospital, Charleston, W. Va.
Feldman, Maurice, Jr.....	Michael Reese Hospital, Chicago, Ill.
Foard, Wilbur Harper.....	University Hospital, Baltimore, Md.
Futterman, Perry.....	University Hospital, Baltimore, Md.
García Y García, José Antonio.....	St. Elizabeth Hospital, Chicago, Ill.
Gassaway, Franklyn Drennan.....	South Baltimore General Hospital, Baltimore, Md.
Godlove, John Carlton.....	Maryland General Hospital, Baltimore, Md.
Goldstein, Marvin.....	University Hospital, Baltimore, Md.
Grumbine, Francis Levine.....	Bon Secours Hospital, Baltimore, Md.
Guthrie, William Wilkinson.....	Newark City Hospital, Newark, N. J.
Guy, Ernest Gordon.....	University Hospital, Baltimore, Md.
Hamill, James Edward.....	Santa Rosa Hospital, San Antonio, Texas
Hayden, Richard Carroll.....	Bon Secours Hospital, Baltimore, Md.
Herold, Paul Garmer.....	Maryland General Hospital, Baltimore, Md.
Hobelmann, Charles Frederick.....	Mercy Hospital, Baltimore, Md.
Hölljes, Henry Wirt.....	University Hospital, Baltimore, Md.
Horn, Helen Amelia.....	University Hospital, Baltimore, Md.
Houska, Henry John.....	St. Joseph's Hospital, Baltimore, Md.
Ingram, Phyllis Ray.....	Church Home and Hospital, Baltimore, Md.

Ingram, William Braxton.....	United States Naval Hospital
Jernigan, John Mayo, Jr.....	University Hospital, Baltimore, Md.
Jones, Bobby Lee.....	Franklin Square Hospital, Baltimore, Md.
Kishpaugh, Majorie Bird.....	Western Pennsylvania Hospital, Pittsburgh, Pa.
Kreis, George Joseph, Jr.....	United States Naval Hospital
Lambert, Herman James, Jr.....	St. Vincent's Hospital, Portland, Oregon
Lampley, William Askew.....	James M. Jackson Memorial Hospital, Miami, Fla.
Lerman, Philip H.....	Sinai Hospital, Baltimore, Md.
Levine, Stuart Charles.....	Mount Sinai Hospital, Chicago, Ill.
Lilienfeld, Abraham Morris.....	West Baltimore General Hospital, Baltimore, Md.
Littlefield, James Beaton.....	Church Home and Hospital, Baltimore, Md.
Maxwell, George Alexander, Jr.....	United States Naval Hospital
Milloff, Bernard.....	Gallinger Municipal Hospital, Washington, D. C.
Mintzer, Donald Willis.....	University Hospital, Baltimore, Md.
Morrow, Thomas Lacy, Jr.....	United States Naval Hospital
Mosberg, William Henry, Jr.....	University Hospital, Baltimore, Md.
Norment, Richard Baxter, III.....	University Hospital, Baltimore, Md.
O'Donnell, Charles Francis.....	Mercy Hospital, Baltimore, Md.
Osborne, William Wilson.....	Mercy Hospital, Baltimore, Md.
Patterson, Carl Norris.....	Mercy Hospital, Baltimore, Md.
Pierpont, Edwin Lowell.....	Mercy Hospital, Baltimore, Md.
Pool, Champe Clark.....	Mercy Hospital, Pittsburgh, Pa.
Pratt, Louis John, Jr.....	St. Joseph's Hospital, Baltimore, Md.
Ramundo, Michael Raymond.....	Paterson General Hospital, Paterson, N. J.
Reed, Randolph, Edward Burl.....	Mercy Hospital, Pittsburgh, Pa.
Rees, David Thomas, Jr.....	Altoona Hospital, Altoona, Pa.
Riley, Eugene John.....	St. Joseph's Hospital, Baltimore, Md.
Robbins, Morris Allen.....	Cooper Hospital, Camden, N. J.
Rolfes, Harry Franklin.....	Mercy Hospital, Baltimore, Md.
Rubenstein, Albert Irving.....	Mount Sinai Hospital, Philadelphia, Pa.
Scavone, Edmond.....	St. Joseph's Hospital, Baltimore, Md.
Schwartz, Aaron David.....	Kings County Hospital, Brooklyn, N. Y.
Seabright, Howard Lee.....	Ohio Valley General Hospital, Wheeling, W. Va.
Shaw, Charles Edward, Jr.....	Maryland General Hospital, Baltimore, Md.
Simons, George Murray.....	University Hospital, Baltimore, Md.
Spelsberg, Walter Karl.....	Mercy Hospital, Baltimore, Md.
Steinberg, Stanley Herbert.....	Sinai Hospital, Baltimore, Md.
Stichel, Frederick Louis, Jr.....	Bon Secours Hospital, Baltimore, Md.
Taylor, Sarah Alice.....	Charlotte Memorial Hospital, Charlotte, N. C.
Thompson, Lewis Bradford.....	Hartford Hospital, Hartford, Conn.
Tinker, Francis Xavier Paul.....	Mercy Hospital, Baltimore, Md.
Traband, Millard Tolson, Jr.....	University Hospital, Baltimore, Md.
Turner, Roy Byron, Jr.....	Mercy Hospital, Baltimore, Md.
Ullsperger, John Francis.....	Mercy Hospital, Baltimore, Md.
Wehling, Benjamin Bird.....	City Hospital, Akron, Ohio
Wilkins, Kenneth Worth.....	Garfield Memorial Hospital, Washington, D. C.
Wilson, Mary Stuart.....	Church Home and Hospital, Baltimore, Md.
Wooden, Allen Curtis.....	West Baltimore General Hospital, Baltimore, Md.
Woodrum, Olin Cain.....	California Hospital, Los Angeles, Calif.
Wright, Isaac Clark.....	United States Naval Hospital
Yaffe, Stanley Norman.....	Central Dispensary and Emergency Hospital, Washington, D. C.

## MATRICULATES

## SENIOR CLASS, JANUARY 13, 1944 TO SEPTEMBER 29, 1944

ALVAREZ, JOSÉ ALBERTO, <i>University of Puerto Rico</i> .....	Puerto Rico
ANCHELL, MELVIN, <i>B.S., University of Maryland, 1941</i> .....	Maryland
ARDINGER, JOSEPH STANLEY, JR., <i>B.S., University of Maryland, 1943</i> .....	Maryland
BACON, ARTHUR MAYNARD, JR., <i>B.S., Loyola College, 1941</i> .....	Maryland
BELL, HOUSTON LESHER, <i>B.S., University of Maryland, 1943</i> .....	Maryland
BLOXOM, JOHN MADISON, III, <i>B.S., University of Virginia, 1941</i> .....	Virginia
BRADY, CHARLES ELDON, <i>A.B., University of North Carolina, 1939</i> .....	North Carolina
BRADY, FRANK JOSEPH, <i>B.S., Washington College, 1941</i> .....	Maryland
BRANDES, HERBERT GIBBS, <i>B.S., University of Maryland, 1943</i> .....	District of Columbia
BRILL, WARREN DANIEL, <i>B.S., University of Maryland, 1941</i> .....	Maryland
BROWN, RICHARD JAMES, <i>B.S., University of Maryland, 1943</i> .....	Connecticut
BUCKEY, ROBERT BRUCE, <i>A.B., University of New Mexico, 1941</i> .....	Maryland
CALLAHAN, DANIEL HARRY, JR., <i>B.S., Bowdoin College, 1941</i> .....	Massachusetts
CARR, CHARLES EDWIN, JR., <i>B.S., Loyola College, 1941</i> .....	Maryland
CHAPUT, CHARLES DUPRÉ, <i>A.B., Dartmouth College, 1941</i> .....	Massachusetts
CINTRÓN, MIGUEL, <i>West Virginia University</i> .....	Puerto Rico
CLONINGER, ROWELL CONNOR, <i>A.B., Lenoir Rhyne College, 1942</i> .....	North Carolina
COPELAND, HERBERT BERNARD, JR., <i>West Virginia University</i> .....	West Virginia
COWLEY, R. ADAMS, <i>University of Utah</i> .....	Utah
DODD, PATRICIA, <i>B.S., University of Maryland, 1943</i> .....	Georgia
DOUKAS, JAMES A., <i>B.S., Washington College, 1941</i> .....	Maryland
DRAKE, MILES EDWARD, <i>B.S., M.S., Oregon State College, 1933, 1934; Ph.D., University of Southern California, 1938</i> .....	Maryland
EBELING, WILLIAM CARL, III, <i>B.S., University of Maryland, 1943</i> .....	Maryland
ELIAS, THOMAS GLENN, <i>A.B., Western Maryland College, 1941</i> .....	Maryland
EVERETT, JOHN THOMAS, <i>B.S., Mt. St. Mary's College, 1941</i> .....	Maryland
FARKAS, ROBERT WILLIAM, <i>A.B., University of Maryland, 1941</i> .....	Pennsylvania
FEASTER, JAMES HENRY, JR., <i>A.B., West Virginia University, 1941</i> .....	West Virginia
FELDMAN, MAURICE, JR., <i>A.B., The Johns Hopkins University, 1941</i> .....	Maryland
FOARD, WILBUR HARPER, <i>Asbury College</i> .....	Maryland
FUTTERMAN, PERRY, <i>A.B., The Johns Hopkins University, 1941</i> .....	Maryland
GARCÍA Y GARCÍA, JOSÉ ANTONIO, <i>B.S., University of Puerto Rico, 1941</i> .....	Puerto Rico
GASSAWAY, FRANKLYN DRENNAN, <i>B.S., University of Maryland, 1943</i> .....	Arizona
GODLOVE, JOHN CARLTON, <i>A.B., Dickinson College, 1933</i> .....	Maryland
GOLDSTEIN, MARVIN, <i>A.B., The Johns Hopkins University, 1941</i> .....	Maryland
GRUMBINE, FRANCIS LEVINE, <i>A.B., Western Maryland College, 1941</i> .....	Maryland
GUTHRIE, WILLIAM WILKINSON, <i>A.B., University of Pennsylvania, 1941</i> .....	West Virginia
GUY, ERNEST GORDON, <i>B.S., University of North Carolina, 1941; University of North Carolina School of Medicine, 1941-1943</i> .....	North Carolina
HAMILL, JAMES EDWARD, <i>B.S., University of Maryland, 1941</i> .....	Maryland
HAYDEN, RICHARD CARROLL, <i>B.S., University of Maryland, 1943</i> .....	Maryland
HEROLD, PAUL GARMER, <i>Duke University</i> .....	Maryland
HOBELMANN, CHARLES FREDERICK, <i>A.B., The Johns Hopkins University, 1941</i> .....	Maryland
HÖLLJES, HENRY WIRT DUVALL, <i>A.B., Western Maryland College, 1941</i> .....	Maryland
HORN, HELEN AMELIA, <i>A.B., Goucher College, 1941</i> .....	Maryland
HOUSKA, HENRY JOHN, <i>A.B., Loyola College, 1941</i> .....	Maryland
INGRAM, PHYLLIS RAY, <i>B.S., University of Vermont, 1943</i> .....	Maryland
INGRAM, WILLIAM BRAXTON, <i>B.S., University of North Carolina, 1942; University of North Carolina School of Medicine 1941-1943</i> .....	North Carolina
JERNIGAN, JOHN MAYO, JR., <i>University of Maryland</i> .....	Maryland
JONES, BOBBY LEE, <i>B.S., University of Maryland, 1941</i> .....	Maryland
KISHPAUGH, MARJORIE BIRD, <i>B.S., Lebanon Valley College, 1941</i> .....	Pennsylvania
KREIS, GEORGE JOSEPH, JR., <i>University of Maryland</i> .....	Maryland
LAMBERT, HERMAN JAMES, JR., <i>B.S., University of Hawaïi, 1941</i> .....	Georgia
LAMPLEY, WILLIAM ASKEW, <i>B.S., Furman University, 1941</i> .....	North Carolina
LERMAN, PHILIP H., <i>University of Maryland</i> .....	Maryland
LEVINE, STUART CHARLES, <i>B.S., University of Maryland, 1941</i> .....	Maryland
LILIENTFELD, ABRAHAM MORRIS, <i>A.B., The Johns Hopkins University, 1941; Albany Medical College, 1941-1942</i> .....	Maryland



- LITTLEFIELD, JAMES BEATON, A.B., *University of Virginia*, 1941.....Massachusetts  
 MAXWELL, GEORGE ALEXANDER, JR., B.S., *University of Maryland*, 1943.....Maryland  
 MILLOFF, BERNARD, B.S., *University of Maryland*, 1941.....Maryland  
 MINTZER, DONALD WILLIS, B.S., *University of Maryland*, 1943.....New Jersey  
 MORROW, THOMAS LACY, JR., B.S., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, 1941-1943.....District of Columbia  
 MOSBERG, WILLIAM HENRY, JR., B.S., *University of Maryland*, 1943.....Maryland  
 NORMENT, RICHARD BAXTER, III, B.S., *University of Maryland*, 1943.....Maryland  
 O'DONNELL, CHARLES FRANCIS, *The Johns Hopkins University*.....Maryland  
 OSBORNE, WILLIAM WILSON, *University of Georgia*.....Georgia  
 PATTERSON, CARL NORRIS, B.S., *Franklin and Marshall College*, 1941.....Maryland  
 PIERPONT, EDWIN LOWELL, B.S., *University of Maryland*, 1943.....Maryland  
 POOL, CHAMPE CLARK, A.B., *West Virginia University*, 1941.....West Virginia  
 PRATT, LOUIS JOHN, B.S., *Loyola College*, 1941.....Maryland  
 RAMUNDO, MICHAEL RAYMOND, A.B., *Syracuse University*, 1941.....New Jersey  
 RANDOLPH, EDWARD BURL, A.B., *West Virginia University*, 1944.....West Virginia  
 REES, DAVID THOMAS, A.B., *West Virginia University*, 1938.....Pennsylvania  
 RILEY, EUGENE JOHN, B.S., *University of Maryland*, 1943.....Maryland  
 ROBBINS, MORRIS ALLEN, A.B., *University of Pennsylvania*, 1941.....New Jersey  
 ROLFES, HARRY FRANKLIN, B.S., *University of Maryland*, 1943.....Maryland  
 RUBENSTONE, ALBERT IRVING, A.B., *University of Pennsylvania*, 1941.....Maryland  
 SCAVONE, EDMOND, B.S., *Loyola College*, 1941.....Maryland  
 SCHWARTZ, AARON DAVID, A.B., *University of Pennsylvania*, 1941.....New York  
 SEABRIGHT, HOWARD LEE, A.B., *Washington and Jefferson College*, 1941.....West Virginia  
 SHAW, CHARLES EDWARD, JR., B.S., *University of Maryland*, 1943.....Maryland  
 SIMONS, GEORGE MURRAY, B.S., *University of Maryland*, 1943.....Maryland  
 SPELSBERG, WALTER KARL, B.S., *University of Maryland*, 1943.....West Virginia  
 STEINBERG, STANLEY HERBERT, B.S., *University of Maryland*, 1943.....District of Columbia  
 STICHEL, FREDERICK LOUIS, JR., B.S., *University of Maryland*, 1943.....Maryland  
 TAYLOR, SARAH ALICE, B.S., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, 1941-1943.....North Carolina  
 THOMPSON, LEWIS BRADFORD, *Dartmouth College*.....Massachusetts  
 TINKER, FRANCIS PAUL, B.S., *Loyola College*, 1941.....Maryland  
 TRABAND, MILLARD TOLSON, JR., *University of Maryland*.....Maryland  
 TURNER, ROY BYRON, JR., B.S., *University of Maryland*, 1943.....District of Columbia  
 ULLSPERGER, JOHN FRANCIS, A.B., *Loyola College*, 1941.....Maryland  
 WEHLING, BENJAMIN BIRD, B.S., *Wheaton College*, 1941.....Ohio  
 WILKINS, KENNETH WORTH, B.S., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, 1941-1943.....North Carolina  
 WILSON, MARY STUART, A.B., *Randolph-Macon Woman's College*, 1941.....Maryland  
 WOODEN, ALLEN CURTIS, B.S., *Wake Forest College*, 1941.....Maryland  
 WOODRUM, OLIN CAIN, *The Johns Hopkins University*.....Maryland  
 WRIGHT, ISAAC CLARK, B.S., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, 1941-1943.....North Carolina  
 YAFFE, STANLEY NORMAN, B.S., *University of Maryland*, 1941.....Maryland

## JUNIOR CLASS, JANUARY 13, 1944 TO SEPTEMBER 29, 1944

- AMSTERDAM, BENJAMIN, B.S., *University of Maryland*, 1942.....New Jersey  
 ANDERSON, GEORGE HAGAN, B.S., *University of Florida*, 1942.....Florida  
 ARNOLD, GAYLE GARDNER, A.B., *The Johns Hopkins University*, 1942.....Maryland  
 AYD, FRANK JOSEPH, JR., A.B., *Loyola College*, 1942.....Maryland  
 BAGGETT, JOSEPH WOODROW, A.B., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, June 1942-December 1943.....North Carolina  
 BAILEY, CLAUDE FLETCHER, A.B., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, June 1942-December 1943.....North Carolina  
 BARKER, DAVID HARGIS, B.S., *University of Maryland*, 1943.....Maryland  
 BARNES, THOMAS GORDON, II, A.B., *Emory University*, 1942.....Georgia  
 BAROODY, PHILIP CHARLES, A.B., *St. Anselm's College*, 1942.....New Hampshire  
 BELL, DAVID FOWLER, JR., B.S., *University of Maryland*, 1942.....Maryland  
 BERDIANSKY, BENJAMIN, A.B., *The Johns Hopkins University*, 1942.....Maryland  
 BRANNEN, JOSEPH HARRISON, A.B., *Emory University*, 1942.....Georgia



- BRENDLE, WILLIAM KENDIG, B.S., *University of Maryland*, 1942..... Maryland  
 BUTLER, CHARLES LEAVITT, B.S., *University of Alabama*, 1942; *University of Alabama School of Medicine*, June 1942–November 1943..... Alabama  
 BYRNE, ROBERT FRANCIS B.S., *University of Maryland*, 1943..... Maryland  
 CALLENDER, GEORGE, RUSSELL, JR., *University of Maryland*..... District of Columbia  
 CAMPONESCHI, OSCAR WILDE, B.S., *University of Maryland*, 1942..... Maryland  
 CANTER, NATHAN, B.S., *Loyola College*, 1942..... Maryland  
 CLARK, MARY DORCAS, A.B., *West Virginia University*, 1943..... Pennsylvania  
 CONNER, EUGENE HAYWARD, *University of Maryland*..... Maryland  
 COOK, SALLIE, A.B., *University of Pennsylvania*, 1942..... Maryland  
 DAVIS, JOHN BERNARD, *University of Maryland*..... Maryland  
 DAVIS, RALPH FLETCHER, B.S., *University of Maryland* 1942..... Maryland  
 DE ALBA, EDUARDO, JR., A.B., *The Johns Hopkins University*, 1942.. Republic of Panama  
 DENNIS, JOHN MURRAY, *University of Maryland*..... Maryland  
 DOENGES, JOHN PELL, A.B., *Western Maryland College*, 1942..... Maryland  
 FITZPATRICK, VINCENT DEPAUL, JR., A.B., *Loyola College*, 1942..... Maryland  
 FOSTER, WILLIAM LEICESTER, B.S., *University of North Carolina*, 1943; *University of North Carolina School of Medicine*, June 1942–December 1943... North Carolina  
 FRANK, WILLIAM HENRY, *University of Pittsburgh*..... Pennsylvania  
 GANEY, JOSEPH BRANNEN, A.B., *Emory University*, 1942..... Florida  
 GIVENS, AUSTIN EDWARD, A.B., *Pomona College*, 1942..... Maryland  
 GREENLEAF, HELEN EMILY, B.S., *Bucknell University*, 1941..... New Jersey  
 HALL, ARTHUR THOMAS, JR., B.S., *Loyola College*, 1942..... Maryland  
 HAMBURGER, DANIEL OSCAR, A.B., *The Johns Hopkins University*, 1942..... Maryland  
 HANSEN, FRANK WILLIAM, B.S., *Loyola College*, 1942..... Maryland  
 HASKINS, JOHN BUNYAN, *University of Chattanooga*..... Tennessee  
 HAYNES, HOWARD HARRY, JR., *University of Utah*..... Utah  
 HEDRICK, JOHN ALBERT, *Marshall College*..... West Virginia  
 HENNESSY, JOHN FRANCIS, A.B., *The Johns Hopkins University*, 1942... New Jersey  
 HERRICK, STANLEY EDWARD, JR., B.S., *Bowdoin College*, 1942..... Massachusetts  
 HERRMANN, ALBERT CASPER, *University of Maryland*..... Maryland  
 HOLBROOK, WILLIAM ADDISON, JR., B.S., *University of Maryland*, 1942..... Maryland  
 HOYOS-NAPOLEONI, HECTOR ANTHONY, *West Virginia University*..... Puerto Rico  
 HUTCHINS, HARRY, *Emory University*..... Georgia  
 KEISTER, STEPHEN RIDINGER, *Duke University*..... Pennsylvania  
 KELLY, ALEXANDER PALMER, JR., *University of Maryland*..... North Carolina  
 KENWORTHY, RICHARD ALBERT, III, *Yale University*..... Maryland  
 KURLAND, LEONARD TERRY, A.B., *The Johns Hopkins University*, 1942..... Maryland  
 LEMEN, DANIEL BAIR, *University of Maryland*..... Maryland  
 LINTHICUM, CHARLES MILTON, *University of Maryland*..... Maryland  
 MAGUIRE, HENRY FRANCIS, B.S., *Washington College*, 1942..... New Jersey  
 MCNINCH, JAMES ROBINSON, JR., A.B., *Washington & Jefferson College*, 1942..... Pennsylvania  
 MILLER, CLARENCE STOCKTON, *University of Nevada*..... Maryland  
 MYERS, PAUL ROBERT, A.B., *Western Maryland College*, 1942..... Maryland  
 NORTON, ALFRED SIMPSON, *University of Maryland*..... District of Columbia  
 O'NEILL, ALLEN JAY, *University of Maryland*..... Virginia  
 OTT, ROY HAMILTON, JR., A.B., *Williams College*, 1942..... New York  
 OWEN, ARTHUR JOHN, A.B., *Loyola College*, 1942..... Maryland  
 PARHAM, SUMNER MALONE, A.B., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, June 1942–December 1943..... North Carolina  
 PECK, ROBERT DEWITT, A.B., *West Virginia University*, 1942..... West Virginia  
 PHILLIPS, MALCOLM DUDLEY, *Houghton College*..... Maryland  
 PIKE, WARREN HORTON, JR., B.S., *Virginia Military Institute*, 1942..... Indiana  
 REAHL, JOSEPH EDWARD, B.S., *Loyola College*, 1942..... Maryland  
 ROBINSON, WILLIAM HENRY, *The Johns Hopkins University*..... Maryland  
 RODGERS, WILLIAM ANSLEY, A.B., *University of North Carolina*, 1942; *University of North Carolina School of Medicine*, June 1942–December 1943..... Florida  
 ROSENBLATT, LEAH, A.B., *Hood College*, 1942..... Maryland  
 ROSENTHAL, JOHN LAUCHHEIMER, A.B., *The Johns Hopkins University*, 1942.. Maryland  
 RUDO, ALVIN DAVID, *The Johns Hopkins University*..... Maryland  
 RUDO, MARVIN, B.S., *University of Maryland*, 1942..... Maryland  
 SANCHEZ, HILARION, JR., *West Virginia University*..... Puerto Rico

SHELL, JAMES HENRY, JR., B.S., <i>Furman University, 1942; University of North Carolina School of Medicine, June 1942–December 1943.</i>	South Carolina
SOKOLSKI, EDWARD JOHN, A.B., <i>Norwich University, 1942.</i>	Connecticut
STEDEM, ANTHONY FREDERICK AUGUSTINE, JR., A.B., <i>Loyola College, 1942.</i>	Maryland
STEINBACH, STANLEY ROY, A.B., <i>The Johns Hopkins University, 1942.</i>	Maryland
STEWART, CHARLES WILBUR, JR., <i>The Johns Hopkins University.</i>	Maryland
STRAHAN, CHARLES, JR., B.S., <i>Dickinson College, 1942.</i>	Maryland
STREET, RUSSELL BARBER, JR., <i>University of Wisconsin.</i>	Massachusetts
SUMMERLIN, WINSTON LEE, <i>University of Florida.</i>	Florida
TANSEY, JOHN JEROME, <i>Brown University.</i>	Massachusetts
TOMS, PAUL BERNHARDT, A.B., <i>Catawba College, 1942; University of North Carolina School of Medicine, June 1942–December 1943.</i>	North Carolina
TOUCHET, MARY LOUISE, <i>University of Maryland.</i>	Maryland
TREVASKIS, ALLAN EDWARD, B.S., <i>Harvard University, 1942.</i>	Maryland
WAGNER, VICTOR, <i>University of Pennsylvania.</i>	New Jersey
WEINBERG, HAROLD HERBERT, B.S., <i>Loyola College, 1942.</i>	Maryland
WEINTRAUB, JOSEPH, B.S., <i>University of Maryland, 1942.</i>	Maryland
WHEELER, THOMAS EASSON, <i>The Johns Hopkins University.</i>	Maryland
WHITE, JOSEPH MCCURLEY, III, B.S., <i>Loyola College, 1942.</i>	Maryland
WINSLOW, OLIVER PARRY, JR., A.B., <i>The Johns Hopkins University, 1943.</i>	Maryland
WOODWARD, ARTHUR FLETCHALL, B.S., <i>University of Maryland, 1942.</i>	Maryland
ZINBERG, NORMAN EARL, B.S., <i>University of Maryland, 1942.</i>	Maryland

## SOPHOMORE CLASS, JANUARY 13, 1944 TO SEPTEMBER 29, 1944

AMLICKE, JEANNE DOROTHY, B.S., <i>University of Maryland, 1943.</i>	New Jersey
ARNOLD, JESSE HOYT, JR., <i>University of North Dakota.</i>	Maryland
AUDET, CHARLES HENRY, JR., <i>University of Maryland.</i>	Connecticut
AUDET, ROBERT JOSEPH, <i>University of Maryland.</i>	Connecticut
BANNEN, WILLIAM JAMES, JR., B.S., <i>Bethany College, 1943.</i>	Pennsylvania
BAUER, ROBERT EDWARD, A.B., <i>The Johns Hopkins University, 1943.</i>	Maryland
BENAVENT, WALTER JOSÉ, B.S., <i>University of Maryland, 1943.</i>	Puerto Rico
BONIFANT, ALFRED DEMENT, B.S., <i>University of Maryland, 1943.</i>	Maryland
BRICKNER, JOHN GEORGE, III, B.S., <i>University of Maryland, 1944.</i>	Maryland
BROSEMER, LOWELL RUSSELL, B.S., <i>University of California, 1942.</i>	California
BROWN, ELI MATTHEW, B.S., <i>University of Maryland, 1944.</i>	Maryland
BROWN, ROBERT RAY, <i>West Virginia University.</i>	West Virginia
BUCKNER, LOUISE PADDON, B.S., <i>University of Maryland, 1943.</i>	Maryland
CANO, HAROLD VERNON, B.S., <i>University of Maryland, 1944.</i>	New Jersey
CARR, WILLIAM FRANCIS, <i>Mt. St. Mary's College.</i>	Pennsylvania
CHRISTOPHER, THOMAS WEST, <i>Brown University.</i>	Massachusetts
CLYMAN, SIDNEY GARY, B.S., <i>University of Maryland, 1944.</i>	Maryland
CODD, FRANCIS IGNATIUS, <i>University of Maryland, 1944.</i>	Maryland
COHN, JEROME ELIAS, A.B., <i>The Johns Hopkins University, 1943.</i>	Maryland
CONNOR, THOMAS BYRNE, A.B., <i>Loyola College, 1943.</i>	Maryland
CORASANITI, RITA ANNE, <i>University of Maryland.</i>	Maryland
CROSS, RICHARD JOSEPH, JR., B.S., <i>Mt. St. Mary's College, 1943.</i>	Maryland
D'ANTONIO, JOSEPH, <i>Maryville College.</i>	Maryland
DIAZ-CARAZO, JOSÉ, B.S., <i>Mt. St. Mary's College, 1942.</i>	Puerto Rico
DRIGGS, GUY KENNETH, <i>University of Arizona.</i>	Arizona
EARECKSON, VINCENT OFFLEY, JR., B.S., <i>University of Maryland, 1944.</i>	Maryland
EATON, JAY WARREN, <i>University of Maryland.</i>	Maryland
EAVEY, JAMES LEE, B.S., <i>Franklin and Marshall College, 1943.</i>	Maryland
FISCHER, JOSEPH SAMUEL, A.B., <i>The Johns Hopkins University, 1943.</i>	Maryland
FISHER, GEORGE WILLIAM, B.S., <i>Franklin and Marshall College, 1943.</i>	Maryland
FRIEDMAN, ASHER ARTHUR, A.B., <i>The Johns Hopkins University, 1943.</i>	Virginia
FRYE, PAUL EUGENE, <i>University of Maryland.</i>	Maryland
GABY, SAMUEL DAVID, A.B., <i>The Johns Hopkins University, 1943.</i>	Maryland
GAMBLE, JOHN REEVES, JR., A.B., <i>Emory University, 1943.</i>	North Carolina
GENTRY, WILLIAM DANIEL, JR., <i>University of Maryland.</i>	Maryland
GERLACH, JAMES JOHNSON, A.B., <i>Colorado College, 1943.</i>	Maryland
GOETZ, ABRAHAM AARON, A.B., <i>The Johns Hopkins University, 1944.</i>	New York

GRAY, HARRY WILLIAM, B.S., <i>University of Maryland</i> , 1944.....	Maryland
GREENFIELD, DUANE LEONARD, A.B., <i>Sioux Falls College</i> , 1939; M.A., <i>Columbia University</i> , 1940.....	Maryland
HANSEN, LELAND JAY, <i>Utah State Agricultural College</i> .....	Utah
HARDIN, HENRY CARTER, JR., A.B., <i>Emory University</i> , 1943.....	Florida
HARLEY, JOHN BARKER, B.S., <i>Dickinson College</i> , 1943.....	Maryland
HAWKINS, CHARLES WILLIAM, <i>University of Chattanooga</i> .....	Tennessee
HEFNER, CHARLES ARTHUR, <i>West Virginia University</i> .....	West Virginia
HENDRICKSON, EDWIN OKEY, III, <i>The Johns Hopkins University</i> .....	Maryland
HILL, HARRY EDWARD, B.S., <i>University of Maryland</i> , 1942.....	Maryland
HUNTER, J. POULSON, B.S., <i>University of Utah</i> , 1943.....	Utah
HYMAN, NATHAN BERNARD, <i>The Johns Hopkins University</i> .....	Maryland
JENNINGS, ERWIN REEVES, A.B., <i>Emory University</i> , 1943.....	Georgia
KIEL, AUGUST, <i>University of Maryland</i> .....	Maryland
KNAPP, HARRY GROVE ROBERT, <i>Colorado College</i> .....	North Dakota
KNOX, LAWRENCE JOSEPH, B.S., <i>University of Maryland</i> , 1944.....	Maryland
LABATIMER, JOHN HOWARD, <i>University of Utah</i> .....	Utah
LEVICKAS, HERBERT JOSEPH, B.S., <i>University of Maryland</i> , 1944.....	Maryland
MACHT, ALLAN HARRIS, B.S., <i>University of Maryland</i> , 1944.....	Maryland
MAHOLICK, LEONARD THOMAS, B.S., <i>University of Maryland</i> , 1944.....	District of Columbia
MARKLEY, RAYMOND LAW, JR., A.B., <i>Gettysburg College</i> , 1943.....	Pennsylvania
MARSHALL, CHARLES BENTON, JR., <i>Ohio University</i> .....	West Virginia
MASSENBURG, GEORGE YELLOTT, <i>Duke University</i> .....	Georgia
MAY, ROBERT EUGENE, A.B., <i>Loyola College</i> , 1942.....	Maryland
McELPATRICK, GEORGE CHARLES, <i>Dartmouth College</i> .....	Delaware
McPHERSON, THOMAS COTESWORTH, <i>Emory University</i> .....	Georgia
McWILLIAMS, CLARENCE EMANUEL, JR., A.B., <i>Western Maryland College</i> , 1943.....	Maryland
MINTZER, JOSEPH HERMAN, B.S., <i>University of Maryland</i> , 1943.....	New York
MITCHELL, JOHN ARMITAGE, <i>Gettysburg College</i> .....	Maryland
MORRISON, JOHN EDWARD, <i>The Johns Hopkins University</i> .....	Maryland
NATARO, JEROME PAUL, B.S., <i>Selon Hall College</i> , 1942.....	New Jersey
NELSON, ROBERT EDWIN, <i>Brown University</i> .....	Massachusetts
NICHOLS, POMEROY, JR., <i>Emory University</i> .....	North Carolina
NORTH, ELLSWORTH HOWARD, JR., B.S., <i>University of Maryland</i> , 1944.....	Maryland
O'HARE, JAMES STEWART, B.S., <i>Loyola College</i> , 1943.....	Maryland
ORRISON, WILLIAM WERNER, A.B., <i>Western Maryland College</i> , 1943.....	Maryland
OSBORNE, HORACE HENRY, <i>University of Georgia</i> .....	Georgia
PARK, WILLIAM FAVRE, <i>University of Maryland</i> .....	Maryland
PAUL, EARL RUPERT, <i>University of Virginia</i> .....	Maryland
PECK, CLEMMER MARCUS, B.S., <i>Hampden-Sydney College</i> , 1942.....	West Virginia
PLATT, LOIS IRENE, A.B., <i>Goucher College</i> , 1931.....	Maryland
RAWLINS, JOHN CALVIN, B.S., <i>Western Maryland College</i> , 1943.....	Delaware
REISCH, MILTON, B.S., <i>University of Maryland</i> , 1944.....	Maryland
REITER, RALPH ALAN, <i>Bridgewater College</i> .....	Maryland
RILEY, ROBERT ANNAN, JR., <i>Emory University</i> .....	Ohio
ROBERTS, JAMES ALWIN, B.S., <i>University of Maryland</i> , 1944.....	Maryland
ROSSBERG, ROBERT CRITTENDEN, B.S., <i>University of Maryland</i> , 1944.....	Maryland
SACKS, SIDNEY, B.S., <i>University of Maryland</i> , 1944.....	Maryland
SEWELL, JAMES ANDERSON, <i>Emory University</i> .....	Florida
SHALLENBERGER, FRANK ANTHONY, JR., <i>Loyola College</i> .....	Maryland
SILLS, DAVID NICHOLSON, JR., <i>University of Maryland</i> .....	Delaware
SMITH, EDWARD MILTON, JR., B.S., <i>University of Maryland</i> , 1944.....	Maryland
SMITH, EDWARD PATRICK, JR., <i>University of Maryland</i> .....	Maryland
STALLARD, CLINTON WOLFE, JR., <i>West Virginia Institute of Technology</i> .....	West Virginia
SWINDELL, HERBERT VAN ARDEN, B.S., <i>University of Maryland</i> , 1944.....	Maryland
TOBY, LEON, A.B., <i>The Johns Hopkins University</i> , 1943.....	Maryland
VAUGHN, JAMES ANDERSON, JR., A.B., <i>Emory University</i> , 1943.....	Florida
WEITZMAN, ELLIOTT LIONEL, <i>The Johns Hopkins University</i> .....	Maryland
WENTZ, IRL JESSE, A.B., <i>Western Maryland College</i> , 1942.....	Pennsylvania
WOLFE, WALTER McILHANEY, JR., <i>Virginia Military Institute</i> .....	Maryland
WORKMAN, JOSEPH BERKELEY, A.B., <i>Western Maryland College</i> , 1943.....	Maryland
YOUNG, ALEXANDER WILLIAM, JR. B.S., <i>University of Maryland</i> , 1944.....	West Virginia
YOUNG, RICHARD ATLEE, A.B., <i>Gettysburg College</i> , 1943.....	Maryland



## FRESHMAN CLASS, JANUARY 13, 1944 TO SEPTEMBER 29, 1944

ABELL, HARRY DAVIS, <i>The Johns Hopkins University</i> .....	Kentucky
ALLEN, GLADYS MARTHA, B.S., <i>University of Maryland, 1943</i> .....	Maryland
ANTHONY, JAMES ELMER, JR., B.S., <i>Washington College, 1944</i> .....	Maryland
BEATTY, JOHN ORVILLE, <i>University of Nevada</i> .....	Nevada
BENSON, JOHN FISHER, <i>University of Maryland</i> .....	Maryland
BENTZ, ALICE RUTH, B.S., <i>University of Maryland, 1943</i> .....	Maryland
BERGGREEN, RAYMOND GEORGE, A.B., <i>Carlton College, 1943</i> .....	Minnesota
BINDEMAN, WILLIAM WYLIE, B.S., <i>Wheaton College, 1944</i> .....	North Carolina
BLEVINS, JOSEPH WENDELL, B.S., <i>Geneva College, 1943</i> .....	Pennsylvania
CAROUGE, GILBERT MORRIS, <i>University of Maryland</i> .....	Maryland
CHASE, HENRY VINCENT, Ph.B., <i>Loyola College, 1943</i> .....	Maryland
COFFEY, MICHAEL JOSEPH, <i>University of Notre Dame</i> .....	New Jersey
COHEN, BERNARD STANLEY, <i>University of Maryland</i> .....	Maryland
COHEN, IRVIN, A.B., <i>The Johns Hopkins University, 1944</i> .....	Maryland
COOPER, HARRY DOUGLAS, B.S., <i>Washington College, 1941</i> .....	Maryland
COOPER, WILLIAM BENJAMIN, JR., <i>University of Maryland</i> .....	Maryland
CORZINE, WILLIAM JENKINS, JR., <i>The Citadel</i> .....	North Carolina
COULTAS, ELIZABETH LOUISE, A.B., <i>Goucher College, 1944</i> .....	New Jersey
CUSHNER, IRVIN MORRIS, <i>University of Maryland</i> .....	Maryland
<sup>1</sup> DAVIES, RUTH CAMILLE, <i>West Virginia University</i> .....	West Virginia
DENTRY, ELIZABETH ANNE GORDON, A.B., <i>Notre Dame College, 1943</i> .....	Maryland
DORMAN, PARKER STURGIS, A.B., <i>Amherst College, 1943</i> .....	District of Columbia
DUVALL, ROBERT CAYWOOD, JR., <i>University of Maryland</i> .....	Maryland
EPPE, WILLIFORD, <i>University of Maryland</i> .....	Maryland
EVANS, JOHN EBENEZER, JR., B.S., <i>Davidson College, 1943</i> .....	North Carolina
FARAINO, FRANK ANTHONY, B.S., <i>Loyola College, 1943</i> .....	Maryland
FISHER, DONALD ERNST, <i>University of Maryland</i> .....	Maryland
FORRER, GORDON RANDOLPH, <i>University of Maryland</i> .....	Maryland
GAKENHEIMER, WILLIAM ALFRED, <i>The Johns Hopkins University</i> .....	Maryland
GARDNER, ROBERT KLINE, <i>University of Maryland</i> .....	Maryland
GEDDES, DAVID KOFOID, <i>University of California</i> .....	California
GERLACH, JANE KNOWLES, A.B., <i>Colorado College, 1943</i> .....	Maryland
GILLSON, EDWARD MICHAEL, A.B., <i>St. Peter's College, 1943</i> .....	New Jersey
GRAU, EDWARD GORDON, B.S., <i>Loyola College, 1943</i> .....	Maryland
GRIFFIN, JAMES EDWARD, A.B., <i>Western Maryland College, 1943</i> .....	Maryland
GROSSMAN, LOUIS WARD, <i>Westminster College</i> .....	Pennsylvania
HAASE, FREDERICK ROBERT, <i>University of Maryland</i> .....	Maryland
HAHN, ROBERT ROLAND, <i>University of Maryland</i> .....	Maryland
HALL, HOWARD ESSEX, <i>Western Maryland College</i> .....	Maryland
HEARNE, CALVIN BECK, <i>College of Wooster</i> .....	Ohio
HOGAN, JOHN FRANCIS, JR., <i>Loyola College</i> .....	Maryland
HOUGHTON, JAMES FRANCIS, <i>Dartmouth College</i> .....	New Jersey
HUNTER, ROBERT CARL, <i>University of Maryland</i> .....	Maryland
IMBRIE, DAVID ELLWOOD, A.B., <i>Washington and Jefferson College</i> .....	Pennsylvania
JERNIGAN, LANE McDERMOTT, <i>University of Maryland</i> .....	Maryland
JUDD, ALLYN FRANCIS, A.B., <i>Tufts College, 1944</i> .....	Massachusetts
LEUNG, BERNARD, <i>University of Maryland</i> .....	New York
LEVIN, NORMAN, <i>University of Maryland</i> .....	Maryland
LIPRA, JOSEPH FRANCIS, <i>University of Maryland</i> .....	Maryland
MACHATA, FRANCIS KARL, Ph.B., <i>Loyola College, 1943</i> .....	New York
MANNINO, PETER PAUL, <i>Western Maryland College</i> .....	Maryland
MANSBERGER, ARLIE ROLAND, JR., <i>Western Maryland College</i> .....	West Virginia
MATTERN, CARL FREDERICK THEODORE, <i>The Johns Hopkins University</i> .....	Maryland
<sup>2</sup> McCAULEY, BETTY JANE, B.S., <i>University of Maryland, 1943</i> .....	Maryland
MITCHELL, WALLACE HERTELLE, B.S., <i>University of Florida, 1943</i> .....	Florida
MORROW, JOHN GORDON, JR., <i>Emory University</i> .....	Georgia
NACHLAS, NATHAN EDWARD, <i>University of Maryland</i> .....	Maryland
PERTZ, ELDEN HOBART, <i>West Virginia Wesleyan College</i> .....	West Virginia
PHILLIPS, DAVID LEE, A.B., <i>The Johns Hopkins University, 1943</i> .....	Maryland

<sup>1</sup> Did not complete the year.<sup>2</sup> Did not complete year—illness.



PIGGOTT, JOHN BURR, JR., B.S., <i>Virginia Military Institute, 1943</i> . . . . .	District of Columbia
POST, WILLIAM REYMAN, <i>University of Mississippi</i> . . . . .	Mississippi
POWELL, JACK HANSON, JR., A.B., <i>Emory University, 1943</i> . . . . .	Georgia
RASCH, GEORGE CHESLEY, JR., <i>University of Maryland</i> . . . . .	Maryland
ROGERS, JOSEPH MEGEATH, <i>University of Maryland</i> . . . . .	Virginia
ROSSER, JOHN HAYS, B.S., <i>Wheaton College, 1943</i> . . . . .	Maryland
<sup>1</sup> RUCKER, NANCY WILLIAMS, A.B., <i>Hollins College, 1940; University of Maryland</i> . . . . .	Virginia
SACHS, SIDNEY HERMAN, <i>University of Maryland</i> . . . . .	Maryland
SCHAPIRO, JOSEPH SOLOMON, <i>The Johns Hopkins University</i> . . . . .	Maryland
SCHNITZKER, WILLIAM FREDERIC, <i>Transylvania College</i> . . . . .	Maryland
SCOTT, HARRY BATY, <i>University of Virginia</i> . . . . .	Virginia
<sup>1</sup> SCOTT, JAMES ZECHEUS, <i>Kemper Jr. Military School</i> . . . . .	Ohio
SENNING, FREDERICK STEPHEN, <i>University of Maryland</i> . . . . .	Maryland
SHAW, JOHN HILL, B.S., <i>Hampden-Sydney College, 1943</i> . . . . .	Virginia
SHEAR, JOSEPH, <i>University of Maryland</i> . . . . .	Maryland
SHULMAN, MELVIN, <i>The Johns Hopkins University</i> . . . . .	Maryland
SILBER, EARLE, <i>The Johns Hopkins University</i> . . . . .	Maryland
SMITH, JOHN RICHARD, JR., B.S., <i>Washington College, 1943</i> . . . . .	Maryland
SPINO, PASCAL DANIEL, <i>Bethany College</i> . . . . .	Pennsylvania
STENSTROM, WILLIAM HAROLD, B.S., <i>College of Puget Sound, 1943</i> . . . . .	Washington
SUSSMAN, HAROLD, A.B., <i>The Johns Hopkins University, 1943</i> . . . . .	Maryland
SWINK, ROBERT LANDRUM, <i>Emory University</i> . . . . .	Florida
TRENCH, JAMES MCKECHAN, <i>Bethany College</i> . . . . .	Pennsylvania
TYLER, JOHN EDWARD, JR., <i>College of the Holy Cross</i> . . . . .	Massachusetts
VALDERAS, JOSÉ GERVASIO, <i>University of Puerto Rico</i> . . . . .	Puerto Rico
VANDEN BOSCHIE, AUGUST HARRY, <i>University of Maryland</i> . . . . .	Maryland
VENABLE, SIDNEY JOHNSON, JR., B.S., <i>Hampden-Sydney College, 1943</i> . . . . .	Maryland
WALTZ, ROBERT CLAUDE, B.S., <i>Washington &amp; Jefferson College, 1943</i> . . . . .	Ohio
WATERMAN, ROGER SHERMAN, <i>Bethany College</i> . . . . .	Pennsylvania
<sup>1</sup> WELLS, BENJAMIN SARGENT, JR., <i>Loyola College</i> . . . . .	Maryland
WHITE, JOHN PHILLIPS, III, <i>The Johns Hopkins University</i> . . . . .	Maryland
WHITEHEAD, SAMUEL LESTER, <i>University of Maryland</i> . . . . .	Maryland
WILLIAMS, JAMES DELBERT, <i>Texas Technological College</i> . . . . .	California
WILLIAMS, JOHNNY ELBERT, <i>Texas Technological College</i> . . . . .	California
WILSON, BENJAMIN JAMES, A.B., <i>West Virginia University, 1943</i> . . . . .	West Virginia
WINOKUR, GEORGE, <i>The Johns Hopkins University</i> . . . . .	Maryland
YOUNG, JOHN PAUL, <i>The Johns Hopkins University</i> . . . . .	Maryland

<sup>1</sup> Did not complete the year.

## SUMMARY OF STUDENTS

(January 13, 1944 to September 29, 1944)

	Male	Female	Total
Senior Class . . . . .	90	6	96
Junior Class . . . . .	83	5	88
Sophomore Class . . . . .	95	4	99
<sup>1</sup> Freshman Class . . . . .	88	8	96
	356	23	379
<sup>1</sup> Withdrawals, 5 . . . . .	2	3	5
	354	20	374

## GEOGRAPHICAL DISTRIBUTION OF STUDENTS

(January 13, 1944 to September 29, 1944)

Alabama . . . . .	1	Delaware . . . . .	1
Arizona . . . . .	2	District of Columbia . . . . .	1
California . . . . .	4	Florida . . . . .	3
Connecticut . . . . .	4	Georgia . . . . .	12

Indiana.....	1	Ohio.....	5
Kentucky.....	2	Pennsylvania.....	17
Maryland.....	217	South Carolina.....	1
Massachusetts.....	9	Tennessee.....	1
Minnesota.....	1	Utah.....	5
Mississippi.....	1	Virginia.....	7
Nevada.....	1	Washington.....	1
New Hampshire.....	1	West Virginia.....	20
New Jersey.....	14		
New York.....	5		
North Carolina.....	19	FOREIGN	
North Dakota.....	1	Republic of Panama.....	1
		Puerto Rico.....	8

## LIST OF COLLEGE SOURCES OF STUDENTS ENROLLED

Session—January 13, 1944 to September 29, 1944

Alabama, University of.....	2	Mt. St. Mary's College.....	4
Amherst College.....	1	Nevada, University of.....	2
Arizona, University of.....	1	New Mexico, University of.....	2
Asbury College.....	1	North Carolina, University of.....	13
Bethany College.....	4	North Dakota, University of.....	1
Bowdoin College.....	2	Norwich University.....	1
Bridgewater College.....	1	Notre Dame, University of.....	1
Brown University.....	3	Oberlin College.....	1
Bucknell University.....	1	Oregon State College.....	1
California, University of.....	3	Pennsylvania, University of.....	6
Carlton College.....	1	Pittsburgh, University of.....	1
Catawba College.....	1	Pomona College.....	1
Chattanooga, University of.....	1	Puerto Rico, University of.....	2
Citadel, The.....	1	Puget Sound, College of.....	1
Colorado College.....	3	Randolph-Macon College.....	1
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Dartmouth College.....	4	St. Peter's College.....	1
Davidson College.....	1	Seton Hall College.....	1
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Duke University.....	4	Southern California, University of.....	1
Emory University.....	16	Syracuse University.....	1
Florida, University of.....	3	Texas Technological College.....	2
Franklin & Marshall College.....	3	Transylvania College.....	1
Furman University.....	2	Trinity College.....	2
Geneva College.....	1	Tufts College.....	1
Georgia, University of.....	2	Utah, University of.....	4
Gettysburg College.....	4	Utah State Agricultural College.....	1
Goucher College.....	2	Vermont, University of.....	1
Hampden-Sydney College.....	3	Virginia Military Institute.....	3
Harvard University.....	1	Virginia, University of.....	4
Hawaii, University of.....	1	Wake Forest College.....	1
Hollins College.....	1	Washington College.....	6
Holy Cross, College of The.....	1	Washington & Jefferson College.....	4
Hood College.....	1	Western Maryland College.....	16
Houghton College.....	1	Westminster College.....	1
Johns Hopkins University, The.....	45	West Virginia Institute of Technology.....	1
Kemper Jr. Military School.....	1	West Virginia University.....	15
Lebanon Valley College.....	1	West Virginia Wesleyan College.....	1
Lenoir Rhyne College.....	1	Wheaton College.....	1
Loyola College.....	31	William & Mary, College of.....	1
Marshall College.....	1	Williams College.....	1
Maryland, University of.....	116	Wisconsin, University of.....	1
Maryville College.....	1	Wooster, College of.....	1
Mississippi, University of.....	1	Yale University.....	1

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The University of Maryland School for Nurses was established in the year 1889. Since that time it has been an integral part of the University of Maryland, coming under the same government. It is a non-sectarian school, the only religious services being morning prayers.

The University Hospital is a general hospital containing about 435 beds. It is equipped to give young women a thorough course of instruction and practice in all phases of nursing.

Programs Offered: The programs of study of the school are planned for two groups of students: (a) the five-year group, (b) the 30-month group.

The requirements for admission to the five-year program of the School of Nursing are the same as for other colleges of the University. The completion of this course entitles the student to the degree of Bachelor of Science from the University of Maryland and to the diploma of the University Hospital School of Nursing.

The requirements for admission to the 30-month program are the satisfactory completion of an academic course in an approved high school. The completion of this course entitles the student to the diploma of the University of Maryland School of Nursing. Blank certificates will be furnished upon application to the Director of the School of Nursing.

#### MERCY HOSPITAL SCHOOL OF NURSING

The Mercy Hospital School of Nursing was established in 1899 and incorporated on December 23, 1901. It is an integral part of the Mercy Hospital



and is under the same government. Mercy Hospital affords exceptional advantages for the education of nurses. It is a general hospital containing 348 beds, and offers opportunities for a thorough and varied experience. By its institutional affiliation with the University of Maryland it secures professors who give to the student the results of their training and experience in the fields of the medical and affiliated sciences.

The University of Maryland, in affiliation with the Mercy Hospital School of Nursing, offers a five year combined Academic and Nursing program. The completion of this course entitles the student to the degree of Bachelor of Science from the University of Maryland, and to the diploma of the Mercy Hospital School of Nursing. Graduate nurses who hold college degrees are greatly in demand, especially for positions in administration and teaching institutions. This program consequently offers a distinct advantage.



## INDEX TO PERSONAL NAMES

- Abell, Harry Davis, 108  
 Abercrombie, John R., 13, 74  
 Actone, Conrad B., 14, 62, 63  
 Acton, Elizabeth, 89, 90, 93  
 Adams, Rowland K., 8  
 Adams, Thurston R., 13, 26, 27, 38, 71, 73, 74, 77, 79  
 Albrightain, J. Warren, 16, 28, 80  
 Allen, Gladys Martha, 108  
 Alvarez, José Alberto, 94, 101, 103  
 Amberson, William R., 9, 10, 60  
 Amlicke, Jeanne Dorothy, 97, 106  
 Amsterdam, Benjamin, 96, 104  
 Anchell, Melvin, 94, 101, 103  
 Andersch, Marie A., 14, 63, 66  
 Anderson, A. Russell, 14, 67  
 Anderson, Franklin B., 11, 21, 40, 75, 77  
 Anderson, George Hagan, 96, 104  
 Anderson, Rubert S., 12, 60  
 Anthony, James Elmer, Jr., 108  
 Appleby, George S., 27, 40  
 Applegarth, Eva, 37  
 Ardinger, Joseph Stanley, 94, 101, 103  
 Arnick, Eleanor, 37  
 Arnold, Gayle Gardner, 96, 104  
 Arnold, James G., Jr., 13, 39, 78  
 Arnold, Jesse Hoyt, Jr., 97, 106  
 Ashbury, Howard H., 38  
 Ashman, Leon, 16, 35, 63, 65  
 Atkins, John L., 16, 64  
 Audet, Charles Henry, Jr., 97, 106  
 Audet, Robert Joseph, 97, 106  
 Aycock, Thomas B., 9, 10, 21, 30, 38, 40, 74, 111  
 Ayd, Frank Joseph, Jr., 96, 104  
  
 Bacon, Arthur Maynard, Jr., 94, 101, 103  
 Baetjer, Walter A., 11, 20, 63  
 Baggett, Joseph Woodrow, 104  
 Baggott, Bartus T., 32  
 Bagley, Charles, Jr., 9, 10, 21, 39, 40, 71, 78  
 Bailey, Claude Fletcher, 104  
 Baldwin, Ruth Workman, 89, 90, 93  
 Ballard, Margaret B., 13, 28, 80  
 Ballard, William Riley, Jr., 89, 90, 93  
 Banker, Jane Louise, 19, 61  
 Bannen, William James, Jr., 97, 106  
 Barker, David Hargis, 96, 104  
 Barkoff, Samuel, 25  
 Barnes, Thomas Gordon, 96, 104  
 Barnett, Donald J., 16, 21, 27, 83  
 Baroody, Philip Charles, 96, 104  
 Basile, Charles J., 40  
 Bauer, Robert Edward, 97, 106  
 Bayley, George, 36  
 Baylus, M., 27  
 Beatty, John Orville, 108  
 Beck, Harry McBrine, 36  
 Beck, Harvey G., 10, 31, 62  
 Beck, Nathaniel M., 16, 35, 64, 67  
 Behr, Eleanor, 33  
  
 Belemer, J. J., 39  
 Bell, David Fowler, Jr., 96, 104  
 Bell, Frederick K., 19, 61  
 Bell, Houston L., 35  
 Bell, Houston Leshner, 94, 101, 103  
 Benavent, Walter José, 97, 106  
 Bennett, Lillian Feykert, 89, 90, 93  
 Benson, Edith, 33  
 Benson, John Fisher, 108  
 Bentz, Alice Ruth, 108  
 Berdiansky, Benjamin, 96, 104  
 Berggreen, Raymond George, 108  
 Bergland, J. McFarland, 11, 80  
 Berke, Joseph B., 39  
 Berman, Sidney, 25  
 Berry, Herbert Lee, 89, 90, 93  
 Berry, Robert Z., 34  
 Bieren, Roland E., 82  
 Bimestefer, L. W., 39  
 Bindeman, William Wylie, 108  
 Bird, Joseph G., 22  
 Bispham, W. N., 13, 63  
 Bitsack, Joseph William, 89, 90, 93  
 Bizzell, Dorothy, 19  
 Blake, Charles F., 10, 30, 31, 36, 74, 77  
 Blank, H. Robert, 25  
 Blevins, Joseph Wendell, 108  
 Bloxom, John Madison, III, 94, 101, 103  
 Blum, Louis V., 25, 26  
 Blumberg, Joseph M., 16, 28, 64, 66  
 Bongardt, Henry F., 12, 30, 35, 71, 73, 74  
 Bonifant, Alfred Dement, 97, 106  
 Bordley, John, 39  
 Bowe, Dudley P., 13, 28, 80  
 Bowie, Harry C., 16, 58, 72  
 Bowyer, Thomas S., 14, 27, 28, 81  
 Boyd, C. Holmes, 38  
 Boyd, Kenneth B., 13, 27, 80, 81  
 Bradley, J. Edmund, 12, 20, 68  
 Brady, Charles Eldon, 94, 101, 103  
 Brady, Frank Joseph, 94, 101, 103  
 Brady, Leo, 12, 21, 81  
 Brager, Simon H., 13, 30, 35, 36, 71  
 Bramble, Charles E., 33  
 Brandes, Herbert Gibbs, 94, 101, 103  
 Brandt, Frederick Bertram, 89, 90, 93  
 Brannen, Joseph Harrison, 96, 104  
 Brantigan, Otto C., 9, 10, 38, 58, 59, 71, 73, 74  
 Braun, Alma C., 16, 22, 23, 80  
 Brendle, William Kendig, 96, 105  
 Brickner, John George, III, 97, 106  
 Briele, Henry A., 22  
 Brill, Warren Daniel, 94, 101, 103  
 Briscoe, Ruth Lee, 42  
 Brizzolara, Aristo J., 22  
 Brobst, Henry Thomas, 89, 90, 93  
 Brookes, T. Roy, 8  
 Brouillet, George H., 16, 26, 72  
 Brosemer, Lowell Russell, 96, 106

- Brown, Ann Virginia, 14, 61  
 Brown, Charles William, 89, 90, 93  
 Brown, Eli Mathew, 97, 106  
 Brown, James Mack, 89, 90, 93  
 Brown, Richard James, 94, 101, 103  
 Brown, Robert Ray, 97, 106  
 Brown, Thomas R., 40  
 Browne, Kenneth M., 24  
 Buckner, Louise Paddon, 97, 106  
 Bryant, Samuel H., 28  
 Bubert, Howard M., 9, 12, 26, 63  
 Buchness, A. V., 16, 72  
 Buckey, Robert Bruce, 94, 101, 103  
 Buettner, Henry F., 14, 60  
 Buppert, Stuart, 31, 37  
 Burns, Albert, 111  
 Burns, Harold H., 16, 30, 35, 72  
 Burns, J. Howard, 32, 36  
 Butler, Charles Leavitt, 105  
 Byerly, M. Paul, 14, 25, 26, 68  
 Byerly, William L., Jr., 22  
 Byrd, Harry Clifton, 8, 9, 111  
 Byrne, Robert Francis, 96, 105
- Caldwell, Lucile J., 14, 74  
 Callahan, Daniel Harry, Jr., 94, 101, 103  
 Callender, George Russell, Jr., 96, 105  
 Camponeschi, Oscar Wilde, 96, 105  
 Cano, Harold Vernon, 97, 106  
 Canter, Nathan, 96, 105  
 Carey, T. Nelson, 9, 11, 20, 32, 52, 63  
 Carliner, Paul E., 16, 64  
 Carouge, Gilbert Morris, 108  
 Carozza, Anthony F., 16, 25, 26  
 Carr, C. Jelleff, 9, 11, 61  
 Carr, Charles Edwin, Jr., 94, 101, 103  
 Carr, William Fancis, 97, 106  
 Celeste, Sister M., 30  
 Chambers, Earl L., 32  
 Chambers, Thomas R., 11, 30, 71  
 Chance, L. T., 16, 72  
 Chapman, Ross, McC., 9, 10, 20, 67  
 Chaput, Charles Dupré, 24, 94, 101, 103  
 Chase, Henry Vincent, 108  
 Cheney, William S., 16, 72  
 Chenowith, Robert F., 16, 72, 73  
 Chesnut, W. Calvin, 8  
 Chinn, Mary E., 16, 60  
 Christopher, Thomas West, 97, 106  
 Cintrón, Miguel, 94, 101, 103  
 Clapp, Clyde A., 9, 10, 20, 21, 82  
 Clark, Mary Dorcas, 96, 105  
 Clarke, Carl Dame, 11, 83  
 Cloninger, Rowell Connor, 24, 94, 101, 103  
 Clopter, Charlotte, 33  
 Clough, Paul W., 11, 62  
 Clyman, Sidney Gary, 97, 106  
 Coberth, M. E., 40  
 Coblentz, Richard G., 10, 21, 39, 71, 78  
 Codd, Francis Ignatius, 98, 106  
 Coffey, Michael Joseph, 108  
 Cohen, Amelia R., 83  
 Cohen, Bernard Stanley, 108
- Cohen, Irvin, 108  
 Cohn, Jerome Elias, 98, 106  
 Cole, William P., Jr., 8  
 Collenberg, H. T., 33  
 Colon-Gordan, Ernesto, 89, 90, 93  
 Compton, Beverly C., 9, 13, 20, 21, 27, 28, 38, 78, 81  
 Corner, Eugene Hayward, 96, 105  
 Connor, Thomas Byrne, 98, 106  
 Constantini, John, 25  
 Cook, Elmer Ellsworth, Jr., 34, 89, 90, 93  
 Cook, Sallie, 96, 105  
 Cooper, Harry Douglas, 108  
 Cooper, William Benjamin, Jr., 108  
 Copeland, Herbert Bernard, Jr., 94, 101, 103  
 Copeland, Murray M., 13, 28, 39, 71, 78  
 Corasaniti, Rita Anne, 98, 106  
 Cornbrooks, Ernest I., Jr., 14, 27, 38, 78, 81  
 Corpening, William Nye, 23, 89, 90, 93  
 Corzine, William Jenkins, Jr., 108  
 Cottell, Charles E., 24  
 Cotter, Edward F., 14, 62, 69  
 Cotton, Albertus, 9, 10, 31, 33, 35, 40, 75, 83  
 Coughlan, Stuart G., 16, 72  
 Coultas, Elizabeth Louise, 108  
 Councill, W. A. H., 13, 21, 27, 76  
 Covington, E. Eugene, 13, 28, 30, 31, 35, 36, 58, 59, 71, 73, 78  
 Cowley, R. Adams, 24, 94, 101, 103  
 Crawford, Robert C., 16, 64  
 Crosby, Robert MacGonigle Nelson, 34, 89, 90, 93  
 Cross, Richard Joseph, Jr., 98, 106  
 Crouch, J. Frank, 9  
 Culver, Samuel H., 16, 72  
 Currie, Dwight M., 16, 72  
 Curtiss, Robert Kimber, 89, 90, 93  
 Cushner, Irvin Morris, 108  
 Cushing, J. G. N., 14, 67
- Dann, Alfred Henry, 89, 90, 93  
 Dann, Daniel I., 16, 28, 80  
 D'Antonio, Joseph, 98, 106  
 Daue, Edwin O., Jr., 16, 64  
 Davidson, Charles N., 12, 20, 21, 27, 83  
 Davidson, Nachman, 16, 64  
 Davies, Ross, 12, 70  
 Davies, Ruth Camille, 108  
 Davis, Carl L., 9, 10, 59, 60  
 Davis, E. Hollister, 9, 16, 21, 74  
 Davis, George H., 16, 22, 80  
 Davis, John Bernard, 96, 105  
 Davis, John Edward, Jr., 98  
 Davis, John R., 35  
 Davis, John R., Jr., 34  
 Davis, John Staige, 40  
 Davis, Ralph Fletcher, 96, 105  
 Day, Edward Colson, 89, 90, 93  
 de Alba, Eduardo, Jr., 96, 105  
 Debuskey, B. Matthew, 14, 38, 68  
 Deckert, W. Allen, 14, 28, 72, 73, 80, 81  
 DeLuca, Joseph, 23  
 Demarco, S., Jr., 30, 35  
 Demarco, S. J., 15  
 Dennis, John Murray, 96, 105



- Dentry, Elizabeth Anne Gordon, 108  
 Diaz-Carazo, José, 98, 106  
 Dickey, Francis G., 15, 25, 63, 67  
 Diehl, William K., 15, 19, 28, 38, 78, 82  
 Diggs, Everett S., 16, 28, 78, 82  
 Dillon, Harold, 89, 90, 93  
 DiSimone, Nicholas, 34  
 Dixon, D. McClelland, 16, 28, 62  
 Dixon, D. McClellen, 80, 81  
 Dodd, Patricia, 24, 94, 101, 103  
 Dodd, William A., 36  
 Doeller, Charles H., Jr., 16, 32, 33, 36, 80, 81  
 Doenges, John Pell, 96, 105  
 Donahoo, H. C., Jr., 16, 80  
 Donobue, Bernard W., 16, 80  
 Dorman, Hamilton Peacock, 89, 90, 93  
 Dorman, Parker Sturgis, 108  
 Dorman, William, 38  
 Dorsey, Brice M., 10, 28, 79  
 Douglass, Louis H., 9, 10, 20, 21, 24, 38, 80, 81, 111  
 Doukas, James A., 94, 101, 103  
 Doyle, John Justin, 89, 90, 93  
 Drake, Miles Edward, 24, 94, 101, 103  
 Driggs, Guy Kenneth, 98, 106  
 Duckwall, Fred, 27  
 Duffy, William C., 32, 33, 36  
 DuMez, Andrew G., 9  
 Dumler, John C., 13, 27, 28, 38, 78, 81  
 Duncan, Robert D., 16, 72  
 Dunne, Thomas B., 17, 22, 23, 80  
 Dunnigan, Wm. C., 30  
 Duvall, Robert Caywood, Jr., 108  
  
 Eareckson, Vincent Offley, Jr., 98, 106  
 Eastland, J. Sheldon, 12, 31, 35, 63, 111  
 Eaton, Jay Warren, 98, 106  
 Eavey, James Lee, 98, 106  
 Eberling, William Carl, III, 24, 95, 101, 103  
 Edlow, Ernest S., 15, 32, 36, 81  
 Edmunds, Page, 9, 10, 21, 71, 74, 79  
 Edwards, Charles Reid, 9, 10, 20, 21, 40, 71, 73, 111  
 Edwards, Monte, 10, 21, 27, 39, 71, 77  
 Ehrlich, Daniel, 89, 90, 93  
 Elgin, William W., 13, 67  
 Elias, Thomas Glenn, 24, 95, 101, 103  
 Elliott, Ruth, 21, 74  
 Ellis, Francis A., 12, 31, 36, 75  
 Emig, Otto R., 24  
 Eppes, Williford, 108  
 Ermsar, H. F., 26  
 Erwin, J. J., 13, 32, 36, 81  
 Evans, F. Gaynor, 12, 58, 59  
 Evans, John Ebenezer, Jr., 108  
 Evans, William Ellsworth, Jr., 11, 61  
 Everett, Houston, 13, 81  
 Everett, John Thomas, 95, 101, 103  
 Ewing, Jane, 40  
  
 Fankhouser, Russell L., 24  
 Faraino, Frank Anthony, 108  
 Fargo, Leon K., 13, 31, 35, 76  
 Farkas, Robert William, 95, 101, 103  
 Fearing, William L., 15, 25, 69  
  
 Feaster, James Henry, Jr., 95, 101, 103  
 Feldman, Maurice, 12, 32, 36, 67  
 Feldman, Maurice, Jr., 95, 101, 103  
 Ferri, Henry Guy, 89, 90, 93  
 Figge, Frank H. J., 9, 11, 58, 59  
 Fine, Morris A., 17, 25, 27, 63, 76  
 Finegold, Aaron Nathan, 89, 90, 93  
 Fineman, Jerome, 15, 26, 32, 36, 68  
 Finkelstein, A. H., 12, 20, 26, 68  
 Fischer, Joseph Samuel, 98, 106  
 Fisher, Donald Ernst, 108  
 Fisher, George William, 98, 106  
 Fisher, William H., 22  
 Fitzpatrick, Vincent dePaul, Jr., 96, 105  
 Fleck, H. K., 10, 31, 82, 83  
 Flynn, Philip D., 15, 63  
 Foard, Wilbur Harper, 24, 95, 101, 103  
 Foley, J. J., 31  
 Foley, Mary Jane, 34, 89, 90, 93  
 Ford, Frank R., 39  
 Forrer, Gordon Randolph, 108  
 Fort, Wetherbee, 13, 32, 63, 111  
 Foster, Herbert M., 17, 72  
 Foster, William Leicester, 105  
 Fox, Samuel L., 17, 27, 36, 76  
 Frank, William Henry, 96, 105  
 Freedom, Leon, 11, 20, 25, 62, 69  
 Freeman, Irving, 15, 24, 26, 35, 63  
 Frey, Edward L., Jr., 17  
 Friedenwald, Edgar B., 10, 32, 36, 68  
 Friedenwald, Harry, 9, 30, 40  
 Friedenwald, Jonas, 13, 82  
 Friedman, Asher Arthur, 98, 106  
 Frye, Augustus Homer, Jr., 89, 90, 93  
 Frye, Paul Eugene, 98, 106  
 Fugman, Ruth, 33  
 Funk, Audrey M., 17, 64, 66  
 Furlong, Rose L., 21  
 Fusco, J. D., 31, 37  
 Futterman, Perry, 24, 95, 101, 103  
  
 Gaby, Samuel David, 98, 106  
 Gakenheimer, William Alfred, 108  
 Galitz, Eli, 89, 90, 93  
 Galvin, Thomas K., 10, 30, 32, 36, 81  
 Gamble, John Reeves, Jr., 98, 106  
 Ganey, Joseph Brannen, 96, 105  
 Gracia Y García, José Antonio, 95, 101, 103  
 Gardner, Charles C., 22  
 Gardner, Maud M., 40  
 Gardner, Robert Kline, 108  
 Gardner, William S., 9, 32  
 Gareis, L. Calvin, 17, 28, 80  
 Garlick, William M., 17, 35, 72  
 Garrett, Richard Mitchell, 89, 90, 93  
 Gaskell, Jason H., 17, 31, 35, 75  
 Gassaway, Franklyn Drennan, 95, 101, 103  
 Geddes, David Kofoid, 108  
 Gellman, Moses, 11, 21, 27, 40, 75  
 Gentry, William Daniel, Jr., 98, 106  
 Geraghty, Frank J., 14, 63, 111  
 Geraghty, William R., 17, 72  
 Gerlach, James Johnson, 98, 106

- Gerlach, Jane Knowles, 108  
 Gershenson, Betty, 26  
 Gibbs, Robert L., 17, 64  
 Gichner, Joseph E., 10, 20, 62  
 Giglia, Toney R., 34  
 Gillespie, J. Lawrence, 34  
 Gillis, Andrew C., 10, 32, 36, 69  
 Gillis, Francis W., 14, 31, 35, 76  
 Gillis, Marion H., 17, 82  
 Gillson, Edward Michael, 108  
 Ginsberg, Leon, 40  
 Givens, Austin Edward, 96, 105  
 Glass, Frederic A., 15, 27  
 Gleason, Donald F., 24  
 Glick, Samuel S., 14, 26, 68  
 Godlove, John Carlton, 95, 101, 103  
 Goetz, Abraham Aaron, 98, 106  
 Goldman, A., 25  
 Goldsborough, Charles R., 13, 25, 63  
 Goldsmith, Harry, 12, 25, 32, 36, 67  
 Goldstein, Albert E., 14, 61  
 Goldstein, Harold, 28  
 Goldstein, Marvin, 24, 95, 101, 103  
 Golley, K. W., 32  
 Goodman, Julius, 30  
 Goodwin, T. Campbell, 11, 38, 68  
 Gore, Robert J., 17, 26  
 Govatos, George, 17, 72, 73  
 Goynes, Richard L., 17, 28  
 Graff, Henry F., 12, 20, 21, 28, 82, 83  
 Graham, Robert L., 15  
 Granoff, Harry L., 17, 33, 36, 82  
 Grau, Edward Gordon, 108  
 Gray, David B., 34  
 Gray, Harry William, 98, 107  
 Greenfield, William, 33  
 Greenfield, Duane Leonard, 98, 107  
 Greenleaf, Helen Emily, 96, 105  
 Gregory, E. Mildred, 22  
 Greiner, D. James, 12, 61  
 Grenzer, William H., 17, 38, 63  
 Griffin, James Edward, 108  
 Griswold, Robertson, 111  
 Gross, Joseph B., 17, 64  
 Grossman, Louis Ward, 108  
 Grove, Donald B., 17, 72  
 Grumbine, Francis Levine, 95, 101, 103  
 Gubnitsky, Albert, 89, 90, 93  
 Guhleman, Henry V., Jr., 23  
 Gundry, Alfred T., 111  
 Gundry, Lewis P., 12, 24, 25, 63  
 Gundry, Rachel K., 111  
 Guthrie, William Wilkinson, 95, 101, 103  
 Guy, Ernest Gordon, 24, 95, 101, 103  
 Guyther, Joseph Roy, 34, 89, 90, 93  
  
 Haase, Frederick Robert, 108  
 Hachtel, Frank W., 9, 10, 60  
 Hagan, William B., 22, 23  
 Hahn, Robert Roland, 108  
 Hahn, William E., 11, 79  
 Hall, Arthur Thomas, Jr., 96, 105  
 Hall, Howard Essex, 108  
  
 Hamburger, Daniel Oscar, 96, 105  
 Hamill, James Edward, 95, 101, 103  
 Hankin, Samuel J., 17, 25, 26, 64  
 Hannan, Alice R., 37  
 Hannan, Leon, 37  
 Hanrahan, E. M., 15, 71  
 Hanrahan, Edward M., Jr., 33  
 Hansen, Frank William, 105  
 Hansen, Leland Jay, 98, 107  
 Hard, Walter L., 12, 59, 60  
 Hardin, Henry Carter, Jr., 98, 107  
 Harley, John Barker, 98, 107  
 Harne, O. G., 9, 11, 59, 60  
 Harne, William G., 61  
 Harris, William Myrick, 89, 90, 93  
 Harrison, Thurston, 39  
 Haskins, John Bunyan, 105  
 Haught, John Stevenson, 23, 89, 90, 93  
 Hawkins, Charles William, 98, 107  
 Haws, John M., 38  
 Hayden, Richard Carroll, 95, 101, 103  
 Hayleck, Mary L., 17, 68  
 Haynes, Howard Harry, Jr., 96, 105  
 Hayward, Eugene, 111  
 Healy, Robert F., 17, 72, 73  
 Hearne, Calvin Beck, 108  
 Hedrick, John Albert, 96, 105  
 Hedrick, Thomas A., 17, 22, 26, 68  
 Hefner, Charles Arthur, 98, 107  
 Heghinian, Jeannette R., 17, 27  
 Helen, Sister M., 30  
 Helfrich, Raymond F., 14, 30, 35, 71, 73  
 Helfrich, William G., 15, 25, 63  
 Hellen, L. Ann, 17, 61, 66  
 Helms, Samuel T., 15, 63, 66, 76  
 Hendrickson, Edwin Okey, III, 98, 107  
 Henneberger, Lowell P., 38  
 Hennessy, John Francis, 96, 105  
 Herold, Paul Garmer, 95, 101, 103  
 Herrick, Stanley Edward, Jr., 96, 105  
 Herrmann, Albert Casper, 96, 105  
 Hersperger, W. Grafton, 15, 25, 63  
 Hewitt, J. Frank, 15  
 Hibbitts, John T., 14, 27, 38, 81  
 Highstein, Benjamin, 17, 27, 74  
 Hill, Harry Edward, 98, 107  
 Hintz, Carl W., 42  
 Hirschfeld, John H., 17, 76  
 Hobelmann, Charles F., 35, 95, 101, 103  
 Hogan, John F., 14, 27, 76  
 Hogan, John Francis, Jr., 108  
 Hohman, Leslie B., 13, 67  
 Holbrook, William Addison, Jr., 96, 105  
 Holden, Frank A., 15, 28, 82  
 Hollander, Mark, 17, 27, 74  
 Hölljes, Henry Wirt, 24, 95, 101, 103  
 Holzapfel, Henry, Jr., 111  
 Honigman, Alvin H., 22  
 Hooper, Z. Vance, 14, 25, 67  
 Hopkins, John V., 17, 27, 75  
 Horine, Cyrus F., 11, 71  
 Horn, Helen Amelia, 24, 95, 101, 103  
 Hornbrook, Francis Eugene, 34, 89, 90, 93

- Houghton, James Francis, 108  
Houska, Henry John, 95, 101, 103  
Howell, Clewell, 14, 26, 68  
Howell, Roger, 9  
Hoyos-Napoleoni, Hector Anthony, 96, 105  
Hudson, Rollin C., 17, 27, 74  
Hull, Harry C., 12, 38, 58, 71  
Hulla, Jaroslav, 17, 28, 80  
Humphries, William C., 17, 76  
Hundley, J. Mason, Jr., 9, 10, 20, 21, 24, 27, 28, 38, 78  
81  
Hunter, J. Poulson, 98, 107  
Hunter, Robert Carl, 108  
Hussy, Raymond, 11, 20, 39, 63  
Hutchins, Elliott H., 9, 10, 30, 71, 73, 74  
Hutchins, Harry, 96, 105  
Hyman, Calvin, 15, 71, 73  
Hyman, Nathan Bernard, 98, 107  
  
Iguina-Jimeniz, Manual Antonio, 89, 90, 93  
Imbrie, David Ellwood, 108  
Ingenito, Gabriel Andrew, 89, 90, 93  
Ingram, Charles Hal, 23, 89, 90, 93  
Ingram, Phyllis Ray, 95, 101, 103  
Ingram, William Braxton, 95, 102, 103  
Inloes, Benjamin H., Jr., 22  
Inman, B. Wallace, 15, 31, 37, 79  
Inman, Conrad L., 15, 37, 79  
Isales, Luis Manuel, 89, 91, 93  
Ivamoto, Harry K., 19, 61  
  
Jacobson, Meyer W., 15, 25, 63  
Jaffe, Albert, 12, 20, 26, 68  
James, Olliver A., 17, 72  
Jaworski, Melvin Joseph, 23, 89, 91, 93  
Jennings, Erwin Reeves, 98, 107  
Jennings, F. L., 10, 30, 71, 74  
Jennings, Joye J., 15, 60  
Jensen, Jacob R., 17, 28, 80  
Jeppi, Joseph V., 31, 36  
Jerardi, Joseph V., 17, 30, 35, 72  
Jernigan, John M., Jr., 24, 95, 102, 103  
Jernigan, Lane McDermott, 108  
Jewett, Hugh, 17, 39, 76  
Johnson, Edward S., 11, 71  
Johnson, Elizabeth, 33  
Johnson, Marius P., 17, 38, 80  
Johnson, William R., 15, 26, 71, 73  
Jones, Bobby Lee, 95, 102, 103  
Jones, Edward G., 17, 22  
Joseph, Sister M., 30  
Josephs, Hugh W., 11, 38, 68  
Joslin, C. Loring, 9, 10, 20, 24, 26, 68  
Judd, Allyn Francis, 108  
Judd, Charles C. W., 11, 63  
  
Kadan, Ferd. E., 17, 28, 80  
Kahn, M. Randolph, 10, 82  
Kallins, Edwards S., 15, 26, 63  
Kaltreider, D. Frank, 17, 28, 80, 81  
Kammer, William H., Jr., 17, 32, 64  
Kanof, N. M., 14, 74  
Kardash, Theodore, 22  
  
Karfgin, Arthur, 17, 64  
Karfgin, Walter E., 25  
Karns, Clyde F., 15, 72, 73  
Karns, James R., 17, 64  
Katzenstein, Lawrence, 17, 63  
Kaufman, Vernon D., 12, 79  
Kayser, F. A., 17, 31, 75  
Keeney, Dan Franklin, 89, 91, 93  
Keister, Stephen Ridinger, 97, 105  
Kelly, Alexander Palmer, Jr., 97, 105  
Kelly, E. F., 111  
Kemler, Joseph I., 14, 31, 82, 83  
Kemper, Charles Alexander, 23, 89, 91, 93  
Kenworthy, Richard Albert, III, 97, 105  
Keown, Lauriston L., 17, 26, 68  
Kevin, Sister M., 33  
Kiel, August, 98, 107  
Kilby, Walter L., 10, 21, 27, 83  
Kindell, Frank B., 14, 38, 61, 73  
King, John T., Jr., 38  
Kinnamon, Howard F., Jr., 17, 72  
Kinney, Earl Ray, 89, 91, 93  
Kirby, Francis J., 111  
Kirby, Ishmael Worth, 89, 91, 93  
Kishpaugh, Marjorie Bird, 95, 102, 103  
Kitlowski, Edward A., 9, 12, 38, 40, 71, 79  
Kleiman, Allen, 89, 91, 93  
Klimes, Louis F., 35, 36  
Klinefelter, Harry F., Jr., 39  
Knapp, Harry Grove Robert, 98, 107  
Knapp, Hubert C., 32  
Knerler, Charles W., 17, 64  
Knotts, E. Paul, 8  
Knowles, F. Edwin, Jr., 14, 21, 36, 82, 83  
Knox, Lawrence Joseph, 98, 107  
Kohn, Schuyler G., 17, 22, 80  
Kolman, Lester N., 15, 27, 74  
Krahl, Vernon E., 15, 58, 59  
Krantz, John C., Jr., 9, 10, 61  
Krause, Louis A. M., 12, 20, 31, 39, 63, 83  
Kreis, George Joseph, Jr., 95, 102, 103  
Kremen, A., 15, 82  
Kroll, Louis J., 17, 64, 65  
Kurland, Leonard Terry, 97, 105  
Kyper, Frederick T., 17, 27, 76  
  
Lambert, Herman James, Jr., 95, 102, 103  
Lampley, William Askew, 95, 102, 103  
Lang, Milton C., 15, 28, 82  
Langeluttig, Harry V., 14, 63  
Langworthy, O. R., 39  
Latimer, Clarence Vinette, Jr., 23, 89, 91, 93  
Latimer, John Howard, 98, 107  
Lavenstein, Arnold F., 18, 26  
Law, Ruth B., 19  
Lawler, Lillian, 33  
Leach, C. Edward, 15, 26, 63  
Lederman, Alfred S., 18, 25, 67  
Lee, F. C., 38  
Legge, John E., 12, 20, 24, 32, 63  
Legge, Kenneth D., 10, 31, 35, 76, 111  
Legum, Samuel, 15, 24, 63, 65  
Leitch, William H., 22

- Leitz, T. Frederick, 32  
 Lemen, Daniel Bair, 97, 105  
 Lerman, Philip H., 95, 102, 103  
 Lerner, Philip F., 15, 32, 36, 69  
 Leung, Bernard, 108  
 Levickas, Herbert Joseph, 98, 107  
 Levin, H. Edmund, 15, 25, 60, 63  
 Levin, Manuel, 25  
 Levin, Norman, 108  
 Levine, Stuart Charles, 95, 102, 103  
 Levy, Kurt, 15, 24, 63  
 Lilienfeld, Abraham Morris, 95, 102, 103  
 Linthicum, Charles Milton, 97, 105  
 Lipin, Raymond J., 35  
 LiPira, Joseph Francis, 108  
 Lisansky, Ephraim T., 18, 26, 62, 64  
 Little, Luther E., 14, 26, 38, 71, 73  
 Littlefield, James Beaton, 95, 102, 104  
 Lloyd, Oliver S., 111  
 Locher, R. W., 12, 30, 71  
 Lochard, G. Carroll, 9, 11, 20, 25, 62, 65, 79  
 Loewald, Hans W., 15, 25, 67  
 Loker, F. Ford, 30  
 Long, Edgar F., 9  
 Long, William B., Jr., 18, 75  
 Looper, Edward A., 9, 11, 20, 21, 40, 75, 76  
 Love, William S., Jr., 12, 20, 26, 62, 63  
 Lowe, William C., 18, 32, 35  
 Lutting, Frederick Wilbur, 89, 91, 93  
 Lutz, John F., 12, 39, 60  
 Lynn, William D., 23  
  
 Maccubbin, H. Pearce, 18  
 Macgowan, Birkhead, 31  
 Machata, Francis Karl, 108  
 Machen, John W., 18, 36, 69  
 Macht, Allan Harris, 98, 107  
 Mack, Ernest W., 18, 72  
 Maginnis, Helen I., 18, 28, 82  
 Maguire, Henry Francis, 97, 105  
 Maholick, Leonard Thomas, 98, 107  
 Maldeis, Howard J., 9, 12, 61, 63, 70  
 Mamula, Peter, 89, 91, 93  
 Manieri, Frank V., 26  
 Mannino, Peter Paul, 108  
 Mansberger, Arlie Roland, Jr., 108  
 Mansdorfer, G. Bowers, 14, 32, 36, 68  
 Mansfield, W. Kenneth, Jr., 18, 28, 80  
 Marie, Sister Paula, 33  
 Markley, Raymond Law, Jr., 98, 107  
 Marks, Arnold Robert, 23, 26, 89, 90, 91, 93  
 Marshall, Charles Benton, Jr., 98, 107  
 Marshall, Joseph, 25  
 Marvel, N. Clyde, 12, 30, 71, 74  
 Maseritz, I. H., 15, 31, 35, 75  
 Massenburg, George Yellott, 98, 107  
 Mattern, Carl Frederick Theodore, 108  
 Maxson, Charles W., 12, 30, 71, 74  
 Maxwell, George Alexander, Jr., 95, 102, 104  
 May, Robert Eugene, 98, 107  
 Maybeno, Albert A., 36  
 Mays, Howard B., 15, 21, 27, 39, 62, 76  
 Mazer, Maxwell L., 18, 28, 80  
  
 McAlpine, James G., 9, 12, 60  
 McCaffery, Henrietta, 33  
 McCarthy, Harry B., 40  
 McCauley, Betty Jane, 108  
 McCormack, Lloyd Leo, 89, 91, 93  
 McElpatrick, George Charles, 98, 107  
 McElwain, Howard B., 18, 30, 72  
 McFadden, Robert Burns, 34, 89, 91, 93  
 McFaul, William N., Jr., 30  
 McGrath, William Edward, Jr., 89, 91, 93  
 McIntosh, Edith R., 42  
 McKenzie, W. Raymond, 14, 31, 75, 111  
 McKinney, William W., 18, 78  
 McLanahan, Samuel, Jr., 18, 38, 72  
 McLaughlin, Francis, 15, 67  
 McLean, George, 13, 31, 63, 65  
 McMillin, Parker, J., 38  
 McMullin, Joseph Frederick, 89, 91, 93  
 McNally, Hugh B., 15, 21, 28, 38, 80, 81  
 McNinch, James Robinson, Jr., 97, 105  
 McPherson, Thomas Cotesworth, 98, 107  
 McWilliams, Clarence Emanuel, Jr., 98, 107  
 Meade, Forest C., 22  
 Meade, DeVoe Kepler, 89, 91, 93  
 Mearns, Robert B., 18, 64  
 Mech, Karl F., 18, 62  
 Medairy, George C., 18, 36, 69  
 Meranski, Israel P., 18, 26, 68  
 Merkel, Walter C., 12, 33, 61  
 Meyerowitz, Joseph R., 26  
 Miksinski, B. W., 39  
 Millan, Lyle J., 14, 21, 27, 76  
 Miller, Clarence Stockton, 97, 105  
 Miller, Sydney R., 12, 63  
 Milloff, Bernard, 95, 102, 104  
 Mintzer, Donald W., 24, 95, 102, 104  
 Mintzer, Joseph Herman, 98, 107  
 Miranda, Angel Neftali, 89, 91, 93  
 Mitchell, George, W., 31  
 Mitchell, John Armitage, 98, 107  
 Mitchell, Robert B., Jr., 15, 26, 63  
 Mitchell, Wallace Herttell, 108  
 Moores, J. Duer, 15, 28, 71, 78  
 Morgan, Jack Calvin, 89, 91, 93  
 Morgan, Zachariah, 9, 13, 20, 25, 67  
 Morris, Frank K., 15, 32, 36, 80, 81  
 Morrison, John Edward, 98, 107  
 Morrison, John H., 18, 22, 80  
 Morrison, Samuel, 13, 25, 67  
 Morrison, Theodore H., 11, 32, 67  
 Morrow, John Gordon, Jr., 108  
 Morrow, Thomas Lacy, Jr., 95, 102, 104  
 Mosberg, William Henry, Jr., 24, 95, 102, 104  
 Moulton, Edith W., 19  
 Muller, S. Edwin, 18, 26, 32, 35, 64, 66  
 Murdock, Harry M., 13, 20, 67  
 Muse, Joseph E., Jr., 18, 25, 64  
 Musser, Ruth, 15, 61  
 Myers, John A., 15, 63, 66, 67  
 Myers, Myron Joseph, 89, 91, 93  
 Myers, Paul Robert, 97, 105  
 Nachlas, Nathan Edward, 108  
 Nataro, Jerome Paul, 98, 107



Nelson, Alfred Turner, 23, 89, 91, 93  
 Nelson, James W., 14, 30, 35, 36, 71, 74  
 Nelson, Robert Edwin, 98, 107  
 Nesbitt, Isaac Floyd, 89, 91, 94  
 Newell, H. W., 13, 25, 67  
 Nichols, Pomeroy, Jr., 98, 107  
 Norment, Richard Baxter, III, 24, 95, 102, 104  
 Norris, J. Edward, 18, 28, 80  
 North, Ellsworth Howard, Jr., 98, 107  
 Norton, Alfred Simpson, 97, 105  
 Novak, Emil, 12, 80, 111  
 Novey, M. Alexander, 13, 21, 80, 81  
 Novey, Samuel, 15, 67  
 Nurkin, Joseph, 27  
 Nuttle, Harry H., 8  
  
 O'Brien, Mary J., 21, 74  
 O'Connor, John A., 30  
 O'Donnell, Charles Francis, 35, 95, 102, 104  
 Ogden, Frank N., 14, 61, 111  
 O'Hare, James Stewart, 98, 107  
 O'Leary, Frank Michael, 98  
 O'Neill, Allen Jay, 97, 105  
 O'Rourke, Thomas R., 9, 11, 20, 21, 27, 28, 39, 75, 77  
 Orrison, William Werner, 98, 107  
 Ortega, Luis, 39  
 Osborne, Horace Henry, 98, 107  
 Osborne, William Wilson, 35, 95, 102, 104  
 Oster, Robert H., 12, 60  
 Ott, Roy Hamilton, Jr., 97, 105  
 Owen, Arthur John, 97, 105  
 Owens, Richard S., 18, 77  
 Ozazewski, John Casimir, 34, 89, 91, 94  
  
 Pacienza, F. A., 31, 36  
 Palese, John Michael, 35, 89, 91, 94  
 Palmason, Edward P., 23  
 Palmer, Margaret Virginia, 19, 22, 23, 64  
 Parbam, Sumner Malone, 105  
 Park, William Favre, 98, 107  
 Parr, William A., 18, 77  
 Parsons, John W., 39  
 Paschal, Jarvis D., 23, 24  
 Patterson, Carl Norris, 35, 95, 102, 104  
 Patterson, J. Milton, 8  
 Patterson, Rob't. U., 9, 20  
 Paul, Earl Rupert, 98, 107  
 Peake, C. W., 9, 12, 71, 73  
 Pearson, Grace, 23  
 Peck, Clemmer Marcus, 99, 107  
 Peck, Robert DeWitt, 97, 105  
 Pels, Isaac R., 39  
 Pertz, Elden Hobart, 108  
 Pessagno, D. J., 11, 30, 71  
 Peters, H. Raymond, 9, 11, 30, 31, 33, 35, 62, 66  
 Peters, Robert Joseph, 89, 91, 94  
 Pfeil, E. Thornton, Jr., 23, 24  
 Pfeil, Edgar Thornton, 89, 90, 91, 94  
 Phelan, Patrick C., Jr., 34  
 Phelps, Winthrop M., 40  
 Philip, Sister M., 30  
 Phillips, David Lee, 108  
 Phillips, Malcolm Dudley, 97, 105

Pierce, Leslie Harrell, 18, 19, 25, 64  
 Pierpont, Edwin Loell, 35, 95, 102, 104  
 Piggott, John Burr, Jr., 109  
 Pike, Warren Horton, Jr., 97, 105  
 Pinas, Samuel Ronald, 89, 91, 94  
 Pincoffs, Maurice C., 11, 20, 30, 31, 35, 62  
 Platt, Lois Irene, 99, 107  
 Pomeroy, William Henry, II, 89, 91 94  
 Pool, Champe Clark, 95, 102, 104  
 Post, William Reyman, 109  
 Poth, Edgar J., 38  
 Powell, Jack Hanson, Jr., 109  
 Pratt, Louis John, Jr., 95, 102, 104  
 Preinkert, Alma H., 9  
 Price, Philip B., 38  
 Proctor, Donald F., 39  
 Proctor, Samuel E., 18, 26, 72  
 Pushkin, Benjamin, 13, 25, 69  
 Pyle, J. Freeman, 9  
  
 Queen, J. Emmett, 34  
  
 Raffucci-Arce, Francisco Luis, 89, 91, 94  
 Ramsey, Wilbur O., 23  
 Ramundo, Michael Raymond, 95, 102, 104  
 Randolph, Edward Burl, 95, 102, 104  
 Range, James Jacob, 23, 89, 91, 94  
 Rasch, George Chesley, Jr., 109  
 Raskin, M., 31, 36  
 Rathbun, Howard K., 39  
 Ratliff, Cliff, Jr., 23, 89, 91, 94  
 Rawlins, John Calvin, 99, 107  
 Reahl, Joseph Edward, 97, 105  
 Ream, Norman, 89, 91, 94  
 Reavis, Charles W., 18  
 Recht, John Munn, 89, 91, 94  
 Reeder, J. Dawson, 9, 11, 21  
 Rees, David Thomas, Jr., 95, 102, 104  
 Reese, J. G. M., 9, 13, 20, 21, 80, 81  
 Reese, J. Morris, 38  
 Reifschneider, Charles A., 9, 11, 38, 71, 73, 74, 79, 111  
 Reifschneider, Herbert E., 15, 58, 72, 79  
 Reimann, Dexter L., 15, 62, 66  
 Reisch, Milton, 99, 107  
 Reiter, Ralph Alan, 99, 107  
 Reiter, Robert A., 15, 63, 65  
 Rennie, Thomas A. C., 38  
 Revell, Samuel T. R., 18, 64  
 Rhode, C. Martin, 19  
 Rich, Benjamin S., 14, 27, 31, 36, 40, 75, 77, 111  
 Richards, C. Victor, 25  
 Richards, Esther L., 38  
 Ridgely, I. O., 14, 30, 35, 71  
 Riely, Compton, 11, 21, 75  
 Rienhoff, William F., 30  
 Ries, A. F., 111  
 Rigdon, Henry L., 18, 72  
 Riley, Eugene John, 95, 102, 104  
 Riley, Robert Annan, Jr., 99, 107  
 Rinehart, Arthur Middleton, 23, 89, 91, 94  
 Robben, John O., 22, 24  
 Robbins, Morris Allen, 95, 102, 104  
 Roberts, James Alwin, 99, 107

- Robertson, Merritt Ezekiel, 23, 89, 91, 94  
 Robinson, Daniel R., 18, 30, 35, 72  
 Robinson, Harry M., 9  
 Robinson, Harry M., Jr., 13, 26, 27, 64, 74  
 Robinson, Harry M., Sr., 11, 21, 27, 40, 74, 75  
 Robinson, J. Ben, 9  
 Robinson, William Henry, 97, 105  
 Rockwell, Alice J., 25  
 Rodgers, William Ansley, 105  
 Roetling, Carl P., 25  
 Rogers, George Carraway, 89, 91, 94  
 Rogers, Harry L., 12, 31, 33, 35, 40, 75  
 Rogers, Joseph Megeath, 109  
 Rogers, William Brannon, Jr., 89, 91, 94  
 Rolfes, Harry Franklin, 35, 95, 102, 104  
 Roop, Donald J., 18, 32, 64  
 Rosenblatt, Leah, 97, 105  
 Rosenthal, John Lauchheimer, 97, 105  
 Rosin, John D., 18  
 Rossberg, Robert Crittenden, 99, 107  
 Rosser, John Hays, 109  
 Rothschild, Stanford Z., 8  
 Rowland, J. M. H., 9  
 Rubenstone, Albert Irving, 95, 102, 104  
 Rucker, Nancy Williams, 109  
 Rudo, Alvin David, 97, 105  
 Rudo, Marvin, 97, 105  
 Russell, Thomas E., 18  
 Ruzicka, F. Frederick, 26  
 Ruzicka, Francis F., Jr., 22, 24  
 Rysanek, William J., Jr., 33, 36
- Sacks, Milton, S., 9, 13, 25, 62, 63, 66, 111  
 Sacks, Sidney, 99, 107  
 Sachs, Sidney Herman, 109  
 Sanchez, Hilarion, Jr., 97, 105  
 Santiago, Stevenson Parker, 89, 91, 94  
 Sapareto, Rocco Louis, 89, 91, 94  
 Sargent, George F., 111  
 Savage, John E., 14, 21, 24, 28, 38, 80  
 Sayles, Harold A., 20  
 Scarborough, Clarence P., 18, 26, 72  
 Scarpulla, Mary, 42  
 Scavone, Edmond, 95, 102, 104  
 Schaefer, John F., 18, 72  
 Schapiro, Joseph Solomon, 109  
 Scherlis, Irving, 89, 91, 94  
 Schmidt, Charles, 15  
 Schmidt, Emil G., 9, 12, 61  
 Schmitz, William J., 18, 32, 68  
 Schmitzker, William Frederic, 109  
 Schwartz, Aaron David, 95, 102, 104  
 Schwartz, Theodore A., 18, 31, 36, 75  
 Scott, Earle S., 18, 26, 68  
 Scott, Harry Baty, 109  
 Scott, James Zeccheus, 109  
 Seabold, William M., 14, 20, 26, 32, 38, 68, 111  
 Seabright, Howard Lee, 95, 102, 104  
 Seegar, J. King B. E., Jr., 18, 80  
 Seliger, R. V., 40  
 Semmes, John E., 8  
 Senning, Frederick Stephen, 109  
 Serra, Lawrence M., 15, 38, 63
- Settle, William B., 14, 26, 27, 38, 58, 59, 71, 73, 81  
 Sevcik, Charles V., 25  
 Sewell, James Anderson, 99, 107  
 Shackelford, Richard T., 14, 30, 35, 71  
 Shallenberger, Frank Anthony, 99, 107  
 Shaw, Charles Edward, Jr., 95, 102, 104  
 Shaw, John Hill, 109  
 Shear, Joseph, 109  
 Sheehan, Joseph C., 34  
 Shell, James Henry, Jr., 106  
 Shelley, Harry S., 14, 21, 27, 76  
 Shilling, M. S., 16, 63  
 Shipley, Arthur M., 9, 11, 20, 38, 40, 71, 73, 74, 111  
 Shipley, Dorothy K., 19, 61  
 Shipley, E. Roderick, 23  
 Shipley, Frank Mollman, 23, 24, 89, 91, 94  
 Shochat, Albert J., 16, 25, 67  
 Shortle, James Samuel, 23, 24, 89, 91, 94  
 Shulman, Melvin, 109  
 Shumacker, Harris B., 38  
 Siegel, Isadore A., 13, 21, 80, 81  
 Siemon, Laura, 40  
 Silber, Earle, 109  
 Sills, David Nicholson, Jr., 99, 107  
 Silverton, George, 18, 63  
 Simons, George Murray, 24, 95, 102, 104  
 Sindler, Joseph, 14, 32  
 Siwinski, Arthur G., 16, 28, 71, 78  
 Skitarelic, Benedict, 16, 62, 64, 66  
 Smith, Dietrich Conrad, 9, 12, 60  
 Smith, Edward Milton, Jr., 99, 107  
 Smith, Edward P., 13, 30, 36, 81, 111  
 Smith, Edward Patrick, Jr., 99, 107  
 Smith, Eugene P., 32  
 Smith, Fred B., 111  
 Smith, Frederick B., 13, 32, 68  
 Smith, John Richard, Jr., 109  
 Smith, Sol, 14, 32, 35, 63, 66  
 Smith, William H., 12, 20, 63  
 Snyder, Jerome, 18, 28, 82  
 Snyder, Samuel, 18, 26, 64  
 Sokolski, Edward John, 97, 106  
 Solomon, Milton L., 58  
 Sones, Frank Mason, Jr., 23, 89, 91, 94  
 Spear, Irving J., 9, 11, 20, 40, 69  
 Spelsberg, Walter Karl, 35, 95, 102, 104  
 Spencer, Hugh R., 9, 11, 20, 33, 40, 61, 111  
 Spino, Pascal Daniel, 109  
 Sprunt, Thomas P., 9, 11, 20, 25, 31, 62  
 Stallard, Clinton Wolfe, Jr., 99, 107  
 Stedem, Anthony Frederick Augustine, Jr., 97, 106  
 Stegall, John Thomas, 89, 91, 94  
 Stein, Milton, 35  
 Steinbach, Stanley Roy, 97, 106  
 Steinberg, Stanley Herbert, 96, 102, 104  
 Steinmueller, Karl J., 16, 71  
 Stenstrom, William Harold, 109  
 Sterling, Harold, 89, 91, 94  
 Stewart, Charles Wilbur, Jr., 97, 106  
 Stewart, Edwin H., Jr., 23, 24  
 Stewart, John Willson, 99  
 Stichel, Frederick Louis, Jr., 96, 102, 104  
 Stifler, William B., 38

- Stiles, Cleo D., 14, 27, 75, 77  
 Strahan, Charles, Jr., 97, 106  
 Strauss, George A., Jr., 13, 32, 36, 81  
 Street, Russell Barber, Jr., 97, 106  
 Strobel, Martin Edward, 23, 89, 91, 94  
 Summerlin, Glenn Olson, 23, 89, 91, 94  
 Summerlin, Winston Lee, 97, 106  
 Sussman, Harold, 109  
 Swindell, Herbert Van Arden, 99, 107  
 Swink, Robert Landrum, 109
- Tanenbaum, Solomon, 18, 27, 74  
 Tansey, John Jerome, 97, 106  
 Tappan, Benjamin, 40  
 Tarun, William, 40  
 Taussig, Helen M., 40  
 Taylor, Sarah Alice, 96, 102, 104  
 Teitelbaum, Harry A., 16, 25, 39, 58, 69  
 Tenner, David, 16, 63  
 Thompson, Lewis Bradford, 96, 102, 104  
 Thompson, Raymond K., 23  
 Thompson, Talmadge Stanley, 23, 89, 91, 94  
 Tilt, LeRoy Wortendyke, Jr., 23, 24, 89, 90, 92, 94  
 Tinker, Francis Xavier Paul, 35, 96, 102, 104  
 Tipton, Dorsey R., 16, 79  
 Toby, Leon, 99, 107  
 Toman, James E. P., 16  
 Toms, Paul Bernhardt, 106  
 Tonolla, E. H., 14, 25, 63  
 Touchet, Mary Louise, 97, 106  
 Touhey, T. J., 18, 30, 72  
 Toulson, W. Houston, 9, 11, 21, 27, 39, 76  
 Townshend, Wilfred H., Jr., 18, 19, 23, 64  
 Traband, John H., 13, 26, 68  
 Traband, Millard Tolson, Jr., 24, 96, 102, 104  
 Travers, Margaret, 37  
 Trench, James McKechan, 109  
 Trevaskis, Allan Edward, 97, 106  
 Trimble, I. Ridgeway, 14, 30, 35, 38, 71  
 Triplett, W. H., 18, 63  
 Trout, Hugh H., Jr., 18, 72  
 Truitt, Ralph P., 9, 12, 20, 24, 25, 67  
 Trumbo, Robert Benson, 97  
 Tull, Myron G., 16, 70  
 Tumminello, S. A., 32  
 Tunney, Robert B., 34  
 Turner, Philip C., 8  
 Turner, Roy Byron, Jr., 35, 96, 102, 104  
 Tyler, John Edward, Jr., 109
- Uhlenbuth, Eduard, 9, 11, 58, 59  
 Ulbrich, Henry F., 12, 21, 27, 39, 71, 75  
 Ullsperger, John Francis, 35, 96, 102, 104
- Valderas, José Gervasio, 109  
 Valliant, Nancy, 28  
 Vanden Bosche, August Harry, 109  
 Vargas, Dharma Luz, 89, 92, 94  
 Vaughn, James Anderson, Jr., 99, 107  
 Venable, Sidney Johnson, Jr., 109  
 Veronica, Sister M., 30
- Vincent, Sister M., 30  
 Vollmer, Frederick J., 64  
 Voshell, Allen Fiske, 9, 11, 21, 27, 39, 40, 73, 75
- Wagner, John A., 14, 19, 61, 66, 78  
 Wagner, Philip S., 16, 67  
 Wagner, Victor, 97, 106  
 Waknitz, Frederick W., 18, 72  
 Waldrop, Grayson Spencer, 89, 92, 94  
 Waldrop, Wm. L., 40  
 Walker, W. Wallace, 16, 58, 59, 71, 73  
 Walkup, Harry Ernest, 89, 92, 94  
 Waller, William K., 18, 64  
 Walsh, Frank B., 39  
 Walsh, Miriam, 33  
 Walton, Henry J., 9, 11, 20, 21, 27, 40, 83, 111  
 Waltz, Robert Claude, 109  
 Ward, Grant E., 12, 21, 28, 39, 71, 78, 79  
 Waring, H. Glenn, 39  
 Warner, C. Gardner, 12, 33, 61, 111  
 Warthen, William H. F., 13, 70  
 Waterman, Roger Sherman, 109  
 Waters, Virginia M., 19, 61  
 Weeks, William Earl, 18, 23, 26, 68  
 Wehling, Benjamin Bird, 96, 102, 104  
 Weiland, Glenn S., 13, 61  
 Weinberg, Harold Herbert, 97, 106  
 Weintraub, Joseph, 97, 106  
 Weitzman, Elliott Lionel, 99, 107  
 Welch, Hugh J., 25, 32  
 Wells, Benjamin Sargent, Jr., 109  
 Wells, Gibson J., 16, 26, 68  
 Wentz, Irl Jesse, 99, 107  
 West, George Brooks, Jr., 89, 92, 94  
 Wheeler, Thomas Easson, 97, 106  
 White, John Phillips, III, 109  
 White, Joseph McCurley, III, 97, 106  
 Whitehead, Hugh G., 16, 63, 66  
 Whitehead, Samuel Lester, 109  
 Whitehurst, Mrs. John L., 8  
 Wich, J. Carlton, 24, 26, 34  
 Wilder, Milton J., 27, 40  
 Wiles, Thelma R., 42  
 Wilfson, Daniel, Jr., 19, 64, 65  
 Will, David Reid, 89, 92, 94  
 Wilkerson, Albert R., 18, 72  
 Wilkerson, J. Herbert, 13, 79  
 Wilkins, Kenneth Worth, 96, 102, 104  
 Wilkins, Mabel, 25  
 Williams, Huntington, 9, 11, 70  
 Williams, James Delbert, 109  
 Williams, Johnny Elbert, 109  
 Williams, Richard T., 23  
 Williams, Thomas Richard, Jr., 89, 92, 94  
 Wilson, Benjamin James, 109  
 Wilson, Julia E., 42  
 Wilson, Mary Stuart, 96, 102, 104  
 Wilson, Thomas L., 19, 23, 24, 82  
 Winokur, George, 109  
 Winship, Emma, 24  
 Winslow, Oliver Parry, Jr., 97, 106  
 Wise, Walter D., 9, 11, 30, 71

- Wisong, Georgiana, 40  
Wlodkowski, Victor Thomas, 99  
Wolfe, Walter McIlhane, Jr., 99, 107  
Wolfe, William D., 31, 36  
Wolff, Thomas C., 9, 13, 32, 35, 63, 65  
Wollenweber, Henry L., 16, 61, 62  
Wood, Austin H., 14, 76, 111  
Wooden, Allen Curtis, 96, 102, 104  
Woodrum, Olin Cain, 96, 102, 104  
Woodward, Arthur Fletchall, 97, 106  
Woolley, Lawrence F., 12, 67  
Worgan, David K., 23  
Workman, Joseph Berkeley, 99, 107  
Wright, Isaac Clark, 96, 102, 104  
Wright, Robert B., 9, 12, 61  
Wylie, H. Boyd, 9, 11, 61, 111  
Yaffe, Stanley Norman, 96, 102, 104  
Yeager, Clark H., 13, 63, 65  
Yeager, George H., 12, 24, 26, 38, 71  
Young, A. D., 33  
Young, Alexander William, Jr., 99, 107  
Young, John Paul, 109  
Young, Richard Atlee, 99, 107  
Zapf, Evelyn Byrd, 40  
Ziegler, John Bosley, 97  
Ziegler, Paul Randall, 34, 89, 92, 94  
Zimmerman, Muriel, 40  
Zinberg, Norman Earl, 97, 106  
Zinn, Waitman F., 11, 30, 31, 36, 75, 76  
Zupnik, Howard L., 30, 35  
Zuravin, Meyer H., 30, 35





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